MARYLAND COASTAL ZONE MANAGEMENT PROGRAM
CZMA SECTION 309 ASSESSMENT

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I. INTRODUCTION

Maryland's Coastal Zone Management Program

Maryland's Coastal Zone Management (CZM) Program was federally approved in 1978 in response to the passage of the Federal Coastal Zone Management Act in 1972, which provides funds to coastal states to develop and administer coastal zone management programs. These programs must "preserve, protect, develop and, where possible, restore our coastal resources." Maryland defines the boundary of its Coastal Zone as the inland boundary of the counties bordering the Atlantic Ocean, Chesapeake Bay and the Potomac River, as far as the municipal limits of Washington, D.C., and includes 16 of the State's 23 counties and Baltimore City. The Maryland CZM Program coordinates multi-year, multi-agency initiatives that provide a framework for statewide and watershed-specific water quality, coastal hazards, public access and habitat restoration efforts.

Section 309 Coastal Zone Enhancement Grant Program

Section 309 of the Coastal Zone Management Act (CZMA), as amended in November 1990, established a voluntary Coastal Zone Enhancement Grants program, which provides funding for projects that address one or more of nine specified enhancement areas: public access, coastal hazards, ocean resources, wetlands, cumulative and secondary impacts, marine debris, special area management planning, energy and government facility siting, and aquaculture. State CZM Programs undertake activities to address those areas they identify as priorities.

In 1997, Maryland developed a three-year Assessment and Strategy that addressed each enhancement area and established one Section 309 protection priority: Cumulative and Secondary Impacts (CSI). Maryland's 1997 - 2000 Strategy for addressing CSI was organized according to several issue areas, including Growth Management and Sensitive Areas Protection, Riparian Forest Buffers, Nonpoint Source Pollution Control, and Economic Impacts of Growth and Land Use Change. The State determined that the other Section 309 areas were adequately addressed through existing management programs or were of low to medium priority.

Because the Coastal Zone Management Act was not reauthorized as expected in 2000, CZM programs were given an extra year to complete work identified in their 1997 Strategies. However, because Maryland's growth management and other efforts under the 1997 Cumulative and Secondary Impacts Strategy had been completed or had other funding, Section 309 funds for 2000-2001 were dedicated to new programs identified as priorities in this Assessment. These initiatives include coastal hazards (shore erosion) and cumulative and secondary impacts (watershed planning and marine protected areas).

Report Organization

The Section 309 Assessment provides an update of priority actions funded between 1997 and 2000. The project highlights are found in Chapter II of the report. These summaries include accomplishments, program changes and improvements. Projects resulting from the 1997 Section 309 Strategy are

grouped according to the cumulative and secondary impact (CSI) issues identified above: (1) Growth Management and Sensitive Areas Protection; (2) Nonpoint Source Pollution Control; (3) Riparian Forest Buffers; and (4) Economic Impacts of Growth and Land Use Change in Maryland's Coastal Bays. In addition, projects funded with FFY 2000 funds are reviewed under Coastal Hazards and CSI - Watershed Restoration Action. Funding years for each of the projects are identified in parentheses.

The remainder of the document is an analysis of the nine enhancement areas according to National Oceanic and Atmospheric Administration's (NOAA) final Section 309 Guidance, dated June 24, 2000. Chapter III of this document contain the assessment of each of the nine Section 309 enhancement areas. The 2001 Strategy for Coastal Hazards and Cumulative and Secondary Impacts is an addendum to this document.

II. SUMMARY OF PAST 309 EFFORTS: 1997 - 2000

Maryland's last 309 Strategy (1997) was tied specifically to advancing the management of Cumulative and Secondary Impacts (CSI). The Strategy was organized according to several issue areas, including Growth Management and Sensitive Areas Protection, Nonpoint Source Pollution Control, Riparian Forest Buffers, and Economic Impacts of Growth and Land Use Change. A number of activities were identified for each of these issue areas for the purposes of modifying and implementing various aspects of the State's Coastal Zone Management Program. An outline of the issue areas and a summary of the associated efforts and their program changes is provided below.

A. Growth Management and Sensitive Areas Protection

Under CSI, Maryland's focus on Growth Management and Sensitive Areas Protection was directed by the Economic Growth, Resource Protection, and Planning Act of 1992. Pursuant to this Act, each county was required to incorporate a sensitive areas element and seven "visions" into their county comprehensive plan. The sensitive areas element was required to contain goals, objectives, principles, policies, and standards designed to protect sensitive areas from the adverse effects of development. Sensitive areas included the following: streams and their buffers, 100 year floodplains, habitats of threatened and endangered species, and steep slopes. Section 309 funds provided technical and direct assistance to twelve local governments from 1992-1999, helping them comply with the 1992 Growth Act through the development and implementation of sensitive areas elements (see Table 1). Activities have included inventorying sensitive areas, modeling different growth scenarios, GIS mapping of sensitive lands, as well as the actual development of the elements. In addition, DNR's Growth and Resource Conservation Division (GRCD) provided technical assistance to all coastal governments on sensitive areas planning and promotion of smart growth and resource protection. More detailed descriptions of projects funded from 1997-2000 are provided below.

Table 1: Local government projects, funded under Section 309 (FY1992-FY1999), to meet the sensitive areas element requirement of the *Economic Growth, Resource Protection, and Planning Act of 1992*.

Local Jurisdiction	Years Funded	Anticipated Program Change	Status
Talbot County	1992-1997*	Development of Sensitive Areas Element to incorporate in Comprehensive Plan	Completed Implementation efforts continue
Kent County	1992-1997*	Development of Sensitive Areas Element to incorporate in Comprehensive Plan	Formally adopted in 1996

Calvert County	1992-1997* 1997-1998	Development of Sensitive Areas Element to incorporate in Comprehensive Plan. Changes to subdivision regulations and zoning ordinance associated with forest interior dwelling birds	Adopted in 1997 Completed/ Under review by planning commission
St. Mary's County	1992-1997*	Development of Sensitive Areas Element to incorporate in Comprehensive Plan	Completed/ Adopted in 1997
Charles County	1992-1997* 1997-1998	Development of Sensitive Areas Element to incorporate in Comprehensive Plan. Major revisions to the County's subdivision and development review procedures Implementation of Sensitive Areas Element through development of Mattawoman Creek Watershed Protection Program	Completed/ Adopted in 1997 Effective August 1996 Adopted in 1997
Harford County	1992-1997* 1997-1998	Preparation of Natural Resource Element Plan for County's Master Plan Revision of the Natural Resource District provisions of the County Zoning Code	Completed Completed/ County now using new NRD
Queen Anne's County	1992-1997*	Development of two sub-area plans	Completed
Anne Arundel County	1997-1998	Development of two small area plans	Being considered by County Council
Baltimore City	1997-1999	Development of flood management plan to be merged with City Comprehensive Plan	Completed/ Currently working to incorporate a sea level rise system
Prince George's County	1997-1998	Development of Woodland Conservation Plan	Pursuing policy and regulation changes
Worcester County	1997-2000	Implementation of County Sensitive Area Element and Coastal Bays Comprehensive Conservation Management Plan	Sensitive Area Element adopted September 1997
Cecil County	1998-1999	Creation of an Urban Growth Boundary and associated changes in zoning ordinance, comprehensive plan and master water and sewer plan	Adopted in 2000

* - These projects were funded under the Maryland Section 309 Strategy for 1992. Additional information on the projects can be found in the *1997 Maryland Coastal Zone Management Program Section 309 Assessment and Strategy*.

Anne Arundel County (1997-1998): *"Sensitive Area Elements of Small Area Plans".* This project focused on the development of regulations, guidelines, and incentives for the protection of sensitive areas through public participation in two Small Area Plans. The project was designed to (1) assess the adequacy of riparian buffers, including the identification of sensitive areas that may require expanded buffers; (2) involve local citizens in identifying sensitive areas and developing protection standards; and (3) use regulations, incentives, and public education to protect and expand riparian buffers. The two areas selected represented different components of Anne Arundel County. The Mayo/Edgewater plan addressed the Bay front rivers and numerous tributary streams, while the Crofton plan lies inland and addressed fewer and more narrow streams. In 1999, draft recommendations for the Small Area Plans were presented to the Planning Advisory Board. The County Council will consider the recommendations during the summer of 2001.

Baltimore City (1997-1999): *"Resource Characterization, Assessment and Evaluation of Streams and their Buffers, Floodplains and Adjacent Steep Slopes in Baltimore City"* and *"Multi-Objective Floodplain Management Plan".* This multi-year project had two separate components: (1) characterize the conditions of Baltimore's stream buffers in order to determine the feasibility of developing additional protection measures and (2) develop a multi-objective, dynamic floodplain management plan for Baltimore City. During the first year, the development and integration of various natural resources maps and databases provided more detailed representation of stream buffer areas. Data acquired from this project were used to develop protection criteria for capital improvements conducted in sensitive areas. In addition, a sensitive area plan for Baltimore was created and a rationale for stream buffer improvement, protection and enhancement was established. The city continues to consider amending existing regulations to better protect sensitive areas or, if necessary, proposing additional regulatory mechanisms.

The second component of this project focused on developing a dynamic floodplain management plan for Baltimore City. The project worked to enhance the city's ability to use GIS for environmental analysis and management. The development of the plan led to the recognition of the diversity of conditions found in the city's floodplains, ranging from completely developed to undisturbed forests. The final project report was reviewed by the Baltimore Department of Planning. Through the support of the City Council and Planning Commission, the report recommendations will be merged with the final version of the city comprehensive plan.

Calvert County (1997-1998): *"Impacts of Alternative Land Use Patterns on Forest Interior Dwelling(FID) Bird Habitat".* Previous work funded under Section 309 led Calvert County to draft the Natural Resource and Sensitive Areas Element in its Comprehensive Plan. This project focused on forest interior dwelling bird (FID) habitat in Calvert County by investigating how development patterns impact FID habitat and identifying those patterns with the least impact. As a result of this project and its associated modeling exercises: (1) amendments to the County's cluster subdivision regulations and Zoning Ordinance have been proposed to the Planning Board and County Commissioners for inclusion in the County's Comprehensive Re-zoning process; (2) FID bird habitat

maps have been drafted; (3) efforts to conserve and preserve forest interior areas should be more effective at reducing impacts on habitat; (4) changes have been proposed to the land conservation/ preservation and growth management tools used in the County; and (5) existing and proposed reforestation programs will give high priority to expanding forest interior habitat.

Charles County (1997-1998): *"Mattawoman Creek Protection Program".* This project enabled the County to develop the Mattawoman Creek Watershed Protection Program, part of an ongoing effort to protect, enhance, or restore riparian corridors within Charles County and to reduce or prevent nonpoint source pollution. Using newly created resource maps, along with previous studies and information, higher priority protection areas were targeted and the environmental and economic benefits of potential stream restoration projects and storm water retrofits were evaluated. The County produced the *Mattawoman Watershed Guidance Document*. The watershed was characterized through a survey of existing physical and landscape conditions, current County planning policies, and current research and management programs. With this information, recommendations and strategies were drafted that will serve as the foundation of a future watershed management plan. These recommendations will be presented to the Charles County Commissioners for adoption as County policy.

Harford County (1997-1998): *"Review and Refinement of Natural Resources District Regulations".* Harford County's Natural Resources District (NRD) regulations were established in 1982 to protect sensitive resources in the County. The goal of this project was to review and revise the NRD provisions of the Harford County Zoning Code to accommodate growth and protect the county's sensitive resources. Activities included: (1) research pertaining to variable buffer widths and other tools used to protect sensitive areas; (2) selection of a pilot urbanized watershed to explore opportunities to protect stream habitats from increased storm water runoff; (3) exploration of means to incorporate protective measures for threatened and endangered species; (4) assessment of the effect of best management practices on nutrient loading; and (5) creation of NRD brochures to educate citizens. These activities led to the development of a revised Natural Resources Districts (NRD) planning map, currently being used by County Planning Staff.

Maryland-National Capital Park and Planning Commission (1997-1998): *"Countywide Woodland Conservation Planning Strategy".* The goal of the project was to develop a comprehensive planning strategy to conserve priority woodlands in Prince George's County by (1) evaluating the effectiveness of the existing Prince George's County's Woodland Conservation and Tree Preservation Ordinance and (2) developing strategies and incentives to conserve priority forest areas. The project built upon previous efforts to digitize sensitive area elements of the Patuxent River Primary Management Area (PMA). Considerable differences were identified in woodland coverage and ecological value in the urban, suburban, and rural areas. The outcomes suggest that the County's woodland conservation program can be improved by refining implementation priorities within the urban, suburban and rural areas to meet definable goals. In addition, the county developed policy and regulatory languages changes to address such priorities. The analysis of past and present woodlands in

Prince George's County, along with discussions with significant stakeholders, led County planners to recommend changes to a variety of tree protection policies and ordinances, as well as, a number of new strategies and programs.

Worcester County (1997-2000): *"Protecting, Preserving and Promoting Worcester's Natural Wealth".* This project was designed to work toward goals associated with implementing Worcester County's Sensitive Areas Element and the Coastal Bays Comprehensive Conservation Management Plan. The first two years of the project focused on the implementation of the sensitive areas elements adopted in September 1997. As a result of this project the County: (1) initiated public education projects; (2) established a computer system to provide staff with access to GIS data; (3) developed environmental guidelines for golf course development; (4) completed Worcester's Coastal Bays Rural Legacy Program application for 1998; (5) developed plans for native habitat enhancement on public properties; (6) inventoried sensitive areas; (7) supported the Maryland Office of Planning in implementing an Alternative Futures project; (8) incorporated Sensitive Species Project Review Area maps into daily planning practices; (9) created and maintained a Department of Planning website for sensitive areas educational outreach; and (10) co-hosted a lecture series titled, "Coastal Community Design."

Worcester County has the lead role in numerous actions identified in the CCMP and this project is critical to their successful implementation. These actions are designed to reduce the loss of shoreline habitat, provide a comprehensive forest strategy, and improve the protection of wetlands. Specifically, this project focused on comprehensive and natural resources planning initiatives such as the review and change of forest conservation law, the preparation of a forest mitigation program with an update of existing law pursuant to State statutory code changes, and changes in the law to reflect the hierarchy for prioritization of protection of sensitive forest areas. This project also provided for continued participation in the Maryland Coastal Bays National Estuary Program, Chesapeake Bay Tributary Strategies Implementation Program, the Lower Eastern Shore Heritage Committee, and the Ocean City and Vicinity Water Resources Study.

Cecil County (1998-1999): *"Urban Growth Boundary Plan".*
Cecil County sought to create an Urban Growth Boundary Plan to influence the location and pace of future growth by extending water and sewer services from existing municipal systems to the County's growth area. The County asserted that until a water supply is available and sewage collection and treatment facilities are constructed, a significant amount of growth will occur at low densities in environmentally sensitive and rural areas of the County. The Plan was designed to: (1) provide the necessary infrastructure to make the growth area attractive to high density development; (2) establish procedures to initiate County/Town cooperation on the extension of water and sewer service into urban growth boundaries around municipalities; and (3) reduce development pressures on rural areas of the County, thereby preserving its agricultural character and economy. The Urban Growth Boundary Plan helped the County determine how to expand existing municipal water and sewer systems into the growth area, making these services available to development. As a result of this project, changes have

been made and adopted by the Cecil County Commissioners in July, 2000, to improve implementation of the Comprehensive Plan by permitting higher density development in the designated growth area.

Maryland Department of Natural Resources, Growth and Resource Conservation Division (1998-2000): *"Local Government Technical Assistance & Outreach for Growth Management Activities".* The Economic Growth, Resource Protection and Planning Act of 1992 and the 1997 Smart Growth and Neighborhood Conservation Initiative have provided the State with new tools to work with local governments in the coastal zone to mange growth and protect valuable environmental resources. DNR's Growth and Resource Conservation Division provided jurisdictions with technical assistance as local governments worked to make their planning activities and development regulations consistent with and complimentary to the state laws.

Division activities included: (1) providing assistance to local governments to develop and implement sensitive areas elements of local comprehensive plans; (2) supporting the Smart Growth Initiative through outreach and implementation activities; (3) helping local governments identify and implement appropriate models, techniques, and practices for better land use management; (4) reviewing local comprehensive plans, sensitive area elements, and local code and ordinances; (5) managing several local government projects; (6) hosting a workshop was on watershed planning; and (7) co-hosting a series of workshops on green design and low impact development. In addition, the Smart Growth Implementation Strategy was drafted and several tasks outlined in the Strategy were undertaken.

B. Nonpoint Source Pollution Control

The development of Maryland's Coastal Nonpoint Pollution Control Program also was an important focus of the State strategy to reduce cumulative and secondary impacts (see 1997 Assessment and Strategy, CSI Strategy 10-14). On December 13, 1999, Maryland's Coastal Nonpoint Program (developed pursuant to Section 6217[a] of the Coastal Zone Act Reauthorization Amendments of 1990 [CZARA]) became the nation's first to garner approval by the U.S. Environmental Protection Agency (EPA) and the National Oceanic and Atmospheric Administration (NOAA). Several projects funded under Section 309 aided in the approval of the Maryland program including the Clean Marina Initiative and the Stormwater Design Manual. Additional nonpoint pollution efforts focused on septic systems, incorporating growth management into tributary strategies, and a comprehensive watershed approach.

Maryland Department of Natural Resources (1997-2000): *"Pollution Prevention at Marinas: An Education and Outreach Effort for Marina and Boat Operators".* Maryland developed a Clean Marina Program to promote pollution prevention and the use of best management practices (BMPs) by marina operators and boaters. The Clean Marina Program responded to one of the NOAA/EPA conditions for final approval of Maryland's Coastal Nonpoint Pollution Control Program. Governor Paris Glendening also included the Clean Marina Program on the Governor's Environmental Agenda.

This project was designed to reduce pollution caused by marina operations and recreational boating

activities through information, education, and incentives that encourage Maryland's more than 500 marinas and 192,000 boaters to practice pollution prevention. The Maryland Clean Marina Initiative is a model program for promoting environmental stewardship to small businesses. The comprehensive nature of the program contributes to its success. Marinas are encouraged to adopt pollution prevention measures through multiple avenues: workshops, publications, training materials, and demonstration projects. The Clean Marina Initiative highlights the need to protect our natural resources and provides the information and tools to do so. So far, 100 marinas have pledged to do their part to "keep Maryland's waterways free of harmful chemicals, excess nutrients, and debris," with 24 of those marinas have been certified as Clean Marinas and 1 is a certified Clean Marina Partner.

Marinas are highly visible, if relatively small, producers of water pollution. Because clean water is so important to recreational boating, most marina operators are willing to do their part to limit the impact of their operations on adjacent waters. Their efforts, however, are often limited by a confusing array of regulations. The Clean Marina Initiative, through its Maryland Clean Marina Guidebook, provides a comprehensive review of best management practices, programs and regulations. Adoption of the best management practices is being promoted through the Clean Marina award program and production of outreach and training materials.

Maryland Department of the Environment (1997-1998): *"Maryland Stormwater Design Manual".* Following through on a Section 309 Project of Special Merit, the Maryland Department of the Environment, Water Management Administration (MDE/WMA) in cooperation with the Center for Watershed Protection (the Center) developed the Maryland State Stormwater Management Design Manual. The project enabled Maryland to revise its stormwater management program by incorporating improved water quality protection, stream channel erosion control, and environmental and smart growth incentives into a manual that can be referenced in the Code of Maryland Regulations (COMAR).

The initial phase of the project focused on the development of stormwater management course materials applicable to the diverse hydrogeologic regions within Maryland's coastal zone. A series of regional workshops were held that focused on the design, review, and inspection of innovative stormwater management practices promoted by the Maryland State Stormwater Management Design Manual.

Maryland's existing stormwater management program is considered one of the nation's most advanced. However, the existing program's focus on flood control and reliance on a preference for BMP selection has hampered MDE's goals to more effectively control nonpoint source pollution, reduce stream channel erosion, and promote innovative stormwater design. The Maryland Stormwater Design Manual is an important tool to accomplish these goals. This project initiated the educational effort needed to promote the design manual. Workshops were designed to introduce and explain new stormwater methodology, as well as review events leading to the design manual's creation. The development of the Maryland Stormwater Design Manual is an effort to incorporate significant experience gained by the State's stormwater community and develop much needed improvements for

managing urban runoff.

Prince George's County (1998-1999): *"Application of the Septic System Nitrogen Loading Model to Unsewered Areas in the Patuxent River Watershed, Plan Development and Tool Application".* Prince George's County Department of Environmental Resources performed a study on domestic septic systems and their impacts on the Patuxent River Watershed. The growth management scenarios and resulting updates to the 10 Year County Comprehensive Water and Sewer Plan helped reduce the nitrogen loading from septic systems in the Patuxent River watershed and provided much needed information for the Chesapeake Bay water quality initiatives. The study: (1) revealed that nitrogen loading to the Patuxent River can be reduced if new on-site treatment technologies are used and (2) demonstrated that improved septic system technologies can dramatically reduce the total nitrogen load released from sanitary sewage to the Patuxent River.

For citizens in Prince George's County to embrace these new technologies, several recommendations were made: verification of innovative technology effectiveness; proper management, operation, and maintenance; support of planners; financial incentives; benefits of selective retrofitting; improved septic modeling; and evaluation of pollutant contributions from septic and land use sources.

Baltimore County, Department of Environmental Protection and Resource Management (1998-1999): *"Baltimore County Rural Sanitary District"*. The study was designed to answer three questions: (1) how can Baltimore County bring water and sewer capacity to areas that lie beyond the Metropolitan District (and in so doing, realize two objectives of the County's proposed master plan: rural commercial centers and rural villages); (2) how can the County perform inspections of on-site sewage disposal systems; and (3) is a sanitary district necessary to perform these services. This project addressed Maryland's need to implement programs for inspecting and maintaining OSDS, as required by the Coastal Nonpoint Source Pollution Control Program of the Coastal Zone Management Act Amendments of 1990. Activities included the identification of an appropriate institutional mechanism to correct rural water and sewer problems, support the County Master Plan's policies for rural Commercial Centers (and other cross roads towns), and provide for area wide environmental management programs. The outcome demonstrated that a sanitary district is unnecessary for fielding an inspection program and bringing community-based water and sewer services to rural Baltimore County.

Maryland Office of Planning (1999-2000): *"Integrating Growth Management into the Tributary Strategies".* Maryland's Tributary Strategies are designed to reduce nutrient loads entering the Bay to 40 percent of the 1985 nutrient load by addressing nutrient problems at their sources, the upstream Bay tributaries. Incorporation of growth management into Maryland's tributary strategy program is essential for many of the tributaries to reach and maintain their goals, especially in areas experiencing development pressure. This project helped integrate growth management into local jurisdictions' planning processes, while assisting in compliance with Tributary Strategy goals, Smart Growth Initiatives, the Clean Water Action Plan agenda, and TMDL nutrient loading caps. Activities included: (1) presentations to tributary teams and local governments; (2) efforts in the Patuxent River

Watershed to develop a water quality monitoring inventory, which will serve as a prototype for other watersheds; (3) review and comment on water resource programs, legislation and policy in the Patuxent watershed; (4) cooperation in the creation of an outreach document relating to growth; and (6) support for the Lower Eastern Shore Tributary Team. In addition, this project aided in efforts to meet the "New and Operating Onsite Disposal Systems" condition placed on the Maryland Coastal Nonpoint Pollution Control Program. This included active participation in the Tributary Team Septic System Task Force.

Department of Natural Resources, Coastal Zone Management Division (1999-2000): *"Coordination of Watershed Activities".* Pursuant to the Clean Water Action Plan, development and implementation of Watershed Restoration Action Strategies (WRAS) began in 1999. The WRAS provides information and guidance to help the public, watershed organizations, and federal, state, and local agencies focus staff and funding in areas and on issues of importance. The goal is to produce measurable environmental improvement. The position funded under this project played a key role in the development of the Maryland WRAS Initiative. Efforts included outreach to local governments, tributary strategy teams and other interested parties; creation of a request for proposals for year one projects; active participation in the DNR steering committee; strategic planning to keep the WRAS effort moving forward; and direct work with local governments selected in the first round of WRAS proposals. WRAS efforts continued with FY2000 funding, which was provided to three coastal counties. Additional information on these projects can be found on page 14 of this document.

C. Riparian Forest Buffers

Maryland's 1997 Section 309 Assessment and Strategy also stressed the need for riparian forest buffers as part of the priority given to the Cumulative and Secondary Impacts enhancement area (see 1997 Assessment and Strategy, CSI Strategy, pp. 7-10). On October 10, 1996, the Chesapeake Executive Council adopted the following goals: (1) to assure, to the extent feasible, that all streams and shorelines are protected by a forested or other riparian buffer; (2) to conserve existing forests along all streams and shorelines; and (3) to increase the use of all riparian buffers and restore riparian forests on 2,010 miles of stream and shoreline in the watershed by 2010, targeting efforts where they will be of greatest value to water quality and living resources. Consequently, Maryland has committed to establishing 600 miles of riparian forest buffers as its part of the overall, multi-state effort. In response, and consistent with the previous strategy, DNR has used Section 309 funds to develop and promote an array of incentives for land owners and developers to encourage voluntary riparian buffer retention and restoration. Section 309 funds were used in 1997 and 1998 to develop the implementation plan to establish riparian forested buffers on lands in private ownership and to develop new incentives and 1999 funds were used to initiate plan implementation.

Maryland Department of Natural Resources, Forest Service (1997-2000): *"Riparian Forest Buffer Implementation Plan".* In addition to the three goals stated above, the Chesapeake Bay Executive Council adopted a number of policy recommendations for states within the Chesapeake drainage (as well as the federal government) to be established by June 30, 1998. This included

development of a riparian buffer implementation plan with conservation and restoration benchmarks. An interagency committee was established to develop a strategy and implementation plan for encouraging the establishment of Riparian Forest Buffers (RFBs) on 90% of lands in private ownership.

A riparian forest buffer implementation plan was developed that identifies RFB sites and creates appropriate incentive packages, including educational/outreach elements sufficient to encourage private landowners to establish RFBs on their land. Draft proposals were produced for new or revised legislation and implementing regulations. However, it was recognized that the 1989 Green Shores Legislation provided DNR with the necessary authority to provide incentives for buffers. Therefore, few actual changes to existing statutes were necessary.

The Maryland Stream ReLeaf Implementation Plan was developed by the interagency Stream ReLeaf Coordination Committee to encourage restoration and conservation of riparian forest buffers. A pilot buffer analysis and outreach project was initiated by a partnership of American Forests and the Lower Western Shore Tributary Team, utilizing a riparian forest buffer targeting system developed for Arc View. A new incentive program for agricultural landowners**,** the Conservation Reserve Enhancement Program, is in place, with the DNR Forest Service delivering technical assistance. This project succeeded in completing its two major elements: 1) providing follow-up support to assure implementation of the incentives recommended by the legislature and 2) improving coordination and reporting with local jurisdictions.

D. Economic Impacts of Growth and Land Use Change in Maryland's Coastal Bays

Maryland's CSI Strategy identified the assessment of economic impacts from development in Maryland's Coastal Bays watershed as a priority. The Coastal Bays area is a biologically productive and diverse ecosystem that supports a variety of commercial and recreational industries. These industries, along with the natural beauty of the area, supports the region's largest tourism industry, with over 12 million vacationers a year spending more than $2.1 billion. A National Estuary Program, called the Maryland Coastal Bays Program, was established in 1997 to help assure that the region's environmental, economic, and cultural needs reinforce, rather than compete with, one another. An important part of the Program's Comprehensive Conservation and Management Plan (CCMP) calls for the development of economic data associated with different growth and development strategies, as well as benefits derived from the watershed's natural resource base. In response, Section 309 funds were used for a two-part study addressing these specific CCMP action commitments.

Maryland Department of Natural Resources, Growth and Resource Conservation Division (1997-1999): *"Economic Impacts of Growth and Land Use Change on Coastal Bays Resources"*. This two-part study provided economic data on growth and development impacts in the coastal bays watershed. Part One was designed to assess the fiscal impacts of providing infrastructure and government services. Impacts were assessed under three alternative growth scenarios developed in conjunction with the Maryland Office of Planning. The study involved collecting data to delineate the average cost of providing infrastructure under each scenario. These costs then were compared to the

economic benefits to the local economy from tax revenues. The results indicated the extent to which current and potential development patterns generate revenues or fiscal burdens for County government.

The second part of the project reflects the need, as outlined in the Maryland Coastal Bays Program Comprehensive Conservation and Management Plan, to better understand the economic benefits derived from the Bays' natural resources. To this end, a study was developed to measure the market value of a range of recreational activities, e.g., fishing, dining, hotels, and boat rentals. Results from this effort should provide a better understanding of how money spent on resource related industries ripples through the economy. Part One was completed in December, 1999. Part two was completed in February 2001. Both Worcester County and the Maryland Coastal Bays Program are considering how to use the study findings.

2000-2001 Funding

Since the Coastal Zone Management Act was not reauthorized in 2000, NOAA permitted states to use section 309 funds either to complete programs in the 1997 strategy or to begin initiatives identified in the new assessment and included in the new strategy. Maryland decided to focus on new initiatives under its two high priority enhancement areas: (1) coastal hazards and (2) cumulative and secondary impacts (CSI). Emphasis within coastal hazards includes shore erosion, hazard mitigation and sea level rise, while CSI focuses on Watershed Restoration Action Strategies. Brief overviews of the projects funded in FFY 2000 are provided below; however, the projects are not completed at this time. Additional information can be found in the Maryland 2001-2005 Section 309 Strategy.

A. Coastal Hazards

The Maryland 2000-2005 Section 309 Strategy for Coastal Hazards focuses on three primary areas: (1) comprehensive shore erosion planning, (2) local hazard mitigation planning and (3) sea level rise. Year one funds have been used to support the comprehensive shore erosion planning effort. This initiative stems from the final report of the Governor's Shore Erosion Task Force, released in January 2000. The process of developing a Comprehensive Shore Erosion Control Plan, as recommended by the Task Force, is a substantive undertaking and is expected to take approximately five years to complete. Once completed, the Plan will significantly change Maryland's current shore erosion control program. Changes to the current program will include: development of state-wide engineering standards and practices, creation of project review and implementation criteria, improved coordination of shore protection activities, improved public awareness regarding shore erosion, and development of regional shore erosion control strategies for the entire state.

Maryland Department of Natural Resources, Coastal Zone Management Division (2000-2001): "Comprehensive Planning for Shore Erosion Control" This project is supporting DNR in its commitment to initiate development of particular elements of the Comprehensive Plan in two coastal counties, St. Mary's and Dorchester. These elements include: (1) the establishment of regional shore erosion control strategies, (2) the development of pilot studies to illustrate the magnitude and subsequent environmental and economic impact of sea level rise and shore erosion, and (3) public

outreach regarding shore erosion. Efforts to date have included:

- acquiring updated shoreline positions for the entire state;
- updating shoreline erosion rates for portions of Dorchester and St. Mary's Counties;
- acquiring high-resolution topographic data (LIDAR) along representative stretches of shoreline in Dorchester and St. Mary's Counties; and,
- public outreach to inform stakeholders about shore erosion causes, solutions and associated issues.

In addition, the following work has begun in the selected counties:

- development of digital elevation models based on the LIDAR data which will be used to identify properties and infrastructure likely to be impacted by sea level rise and shoreline erosion over the next 100 years;
- valuation of the threatened properties and infrastructure;
- development of criteria to identify and prioritize critically eroding shorelines for shore erosion control; and
- development of regional shore erosion control strategies for Dorchester and St. Mary's Counties.

These partnerships will be used as templates for the development of statewide components of the Maryland Comprehensive Shore Erosion Control Plan, which will assist in planning and prioritizing areas in need of assistance on a statewide basis.

B. Cumulative and Secondary Impacts - Watershed Restoration Action Strategies

The Department of Natural Resources has begun partnering with local communities and other agencies to develop local Watershed Restoration Action Strategies (WRAS). The WRAS Program is a multi-year, multi-program approach to integrated watershed protection and restoration. The goal of Watershed Restoration Action Strategies is to comprehensively design and implement water quality and habitat improvement activities on a local watershed scale. This is accomplished by providing local governments with the financial and technical assistance necessary to develop and implement the strategies. Components of the planning process include watershed characterization, stream corridor assessment, public participation, goal setting and action plan development. Additional information on the WRAS initiative can be found in the Maryland 2000-2005 Section 309 Strategy, which is an addendum to this document.

In 2000, three coastal counties were selected as pilots to partner with the Department of Natural Resources in development of a strategy in an identified priority watershed. The projects are described below. Efforts to date in all three watersheds include (1) development of draft watershed characterizations; (2) creation of a steering committee; (3) initiation of stream corridor assessments; and (4) discussion of public involvement.

Kent County (2000-2001): *" Middle Chester River Watershed Restoration Action Strategy"*

The County's goal is to have this strategy, developed with citizens, businesses, the agricultural community, and nonprofit groups, serve as a blue print for restoring and maintaining the watershed's key environmental resources, including water quality, and aquatic and terrestrial habitats. This will be accomplished through: (1) developing a watershed characterization and assessment that will include stream corridor assessments, identification of public access opportunities and completion of impervious surface analysis; (2) enlisting public involvement through outreach efforts; (3) creating an advisory committee to lead the initiative; and (4) completing a watershed management strategy to use in future planning efforts. It is anticipated that the Watershed Conservation and Restoration Strategy will form the basis for the environmental elements of local comprehensive plans. Strategies could also serve as guidelines to insure that new development in the Radcliffe Creek watershed does not impair water quality or habitat.

Somerset County (2000-2001): *"Manokin River Watershed Restoration Action Strategy"* The strategy will help the County in its efforts to assess current conditions relating to the Manokin River and set goals for environmental restoration and development of the Manokin as a resource for the citizens of the County. This will be accomplished through (1) developing a watershed characterization and assessment that includes the natural and physical environment, infrastructure and social structure; (2) enlisting public involvement through outreach efforts; (3) creating a technical advisory committee, watershed steering committee and appropriate subcommittees to direct the process; and (4) completing a watershed management plan that can be used in future planning efforts. It is important to the County that the strategy and any implementation measures result in outcomes meeting the interests and needs of local citizens. After assessments are complete, the County will pursue, with citizen groups, identified goals of a voluntary nature such as mitigation sites for creation of wetlands, forest banking, sediment ponds, riparian buffers, and opportunities for erosion control.

Worcester County (2000-2001): *"Coastal Bays Watershed Restoration Action Strategy – Isle of Wight Subwatershed"* The goal of the strategy is to minimize the impacts to surface and groundwater from land use cover changes in the Isle of Wight Bay. The Watershed Restoration Action Strategy will serve to unify the variety of environmental characterizations currently proposed in the Coastal Bays watershed, such as the Wetlands Functional Assessment and Total Maximum Daily Load Program (TMDL). From this analysis and strategy, specific management recommendations and policy changes will be developed and appropriate actions will be taken as necessary to maintain and improve the buffering capacity and function of the Coastal Bays' tidal and nontidal shoreline areas. A final strategy will be prepared for the Isle of Wight Bay. Strategy development will be accomplished through: (1) drafting a watershed characterization and assessment that includes the natural and physical environment, infrastructure and social structure; (2) enlisting public involvement through outreach efforts; (3) creating a technical advisory committee and watershed management committee to lead the process; and (4) completing a watershed management strategy that can be incorporated into the county comprehensive plan.

Department of Natural Resources, Watershed Restoration Division (2000-2001): *"Stream*

Corridor Assessment Methodology for Watershed Restoration Action Strategies" The Watershed Restoration Division of the Maryland Department of Natural Resources will organize and lead three Stream Corridor Assessments in priority watersheds selected for Watershed Restoration Action Strategies (WRAS). The purpose of the survey is to rapidly assess the general physical condition of the stream system and identify the location of common environmental problems within the stream corridors. The survey is intended to be a tool that can help resource managers identify the location of environmental problems and restoration opportunities that exist within the watershed.

III. ENHANCEMENT AREA ANALYSIS

On a regular basis Coastal Zone Management Programs are asked by the National Oceanic and Atmospheric Administration (NOAA) to assess the status of nine coastal enhancement areas identified in Section 309 of the Coastal Zone Management Act, as amended. The enhancement areas are: public access, coastal hazards, ocean resources, wetlands, cumulative and secondary impacts, marine debris, special area management plans, energy and government facility siting and aquaculture. The assessment process gives states an opportunity to review the status of these programs, record changes and identify gaps.

The 2000 Assessment was developed by answering the assessment questions prepared by NOAA (July 24, 2000). The goal is to determine the status of each enhancement area since the previous Assessment. The following information is provided for each enhancement area: (1) Section 309 program objectives, (2) resource characterization, (3) management characterization and (4) conclusion. The priority of each area is ranked as "high," "medium," or "low."

Maryland plans to focus its attention during the next five years on the Coastal Hazards and Cumulative and Secondary Impacts priority areas. More detail on how these areas will be addressed is provided in the Section 309 Strategy. The other Section 309 enhancement areas should be adequately addressed through existing management programs or are considered low to medium priority at this time. Throughout the document, Section 309 funded activities are identified by a statement to that effect. If no reference is made to Section 309, the activity was supported by other resources.

A. PUBLIC ACCESS

Section 309 Programmatic Objectives

I Improve public access through regulatory, statutory, and legal systems.

II Acquire, improve, and maintain public access sites to meet current and future demand through the use of innovative funding and acquisition techniques.

III Develop or enhance a Coastal Public Access Management Plan which takes into account the provision of public access to all users of coastal areas of recreational, historical, aesthetic, ecological and cultural value.

IV Minimize potential adverse impacts of public access on coastal resources and private property rights through appropriate protection measures.

Resource Characterization

1. Extent of public access.

Access Type	Extent (# of sites and/or # of miles or acres)
State/County/Local Parks	304 sites are listed in the Public Access Guide*

Public Beaches	There are approximately 40 miles of public beach along the Atlantic Coast. A quantitative measure along the Chesapeake Bay shoreline is not currently available.
Public Boat Ramps	206 sites are listed on DNR's boating web page (http://www.dnr.state.md.us/boating/).
Scenic Vistas	A quantitative measure is not currently available.
State or Local Designated Rights-of-Ways	A quantitative measure is not currently available.
Banks/Fishing Piers	261 sites listed in Guide *
Coastal Trails	80 sites listed in Guide *
Disabled Access	An exact number of disabled access sites on a state-wide basis is not known. Both State and local governments are striving to expand accessibility to public facilities for everyone. DNR's "Accessibility for All" website provides a listing of accessible State public lands. There are currently 16 DNR owned and managed sites with disabled access to the Chesapeake Bay, its tidal tributaries, and the Atlantic Coast. More information can be found at http://www.dnr.state.md.us/publiclands/accessforall.html
Boardwalks/Walkways	The exact number of boardwalks/walkways is not known; however, there are a number along the Chesapeake Bay and Atlantic Coasts. Boardwalks are known to be located in Havre de Grace, Ocean City, Chesapeake Beach, North Beach, Rock Hall, Cambridge, and Annapolis.
Swimming Beaches	42 sites listed in the Guide *
Other: Water Trails	Maryland has mapped approximately 600 miles of potential and existing water trails in its 2000 edition of the *Maryland Atlas of Greenways, Water Trails, and Green Infrastructure*. The Chesapeake 2000 Agreement calls for creation of 500 miles of water trails in the Bay states.

* Chesapeake Bay Program. 2000. Chesapeake Bay, Susquehanna River, and Tidal Tributaries Public Access Guide.

2. Briefly characterize the demand for public access.

Demand for public access in Maryland is great. Current levels of access vary within coastal regions. While the Atlantic Coast is very accessible, both the Chesapeake Bay and coastal bays have more limited access. As the State's population continues to increase (1.338 million between 1990 and 2020) it will become more difficult to meet the demand for public access. This is due to the limited public land, the cost of land acquisition, and liability and management concerns.

3. Identify any significant impediments to providing adequate access, including conflicts with other resource management objectives.

One of the major impediments is money. Land values continue to increase, particularly those with Bay access. Population increases and the subsequent increase in the population density in areas near the water make it increasingly difficult to find parcels that are large enough to provide access.

Also, there is a need to protect near-shore areas from overuse. The same areas that provide water access are often important environmentally, including wetlands and shallow seagrass beds. Therefore, it is important to maintain a balance between access and the resources. This can be done by carefully considering the type of access.

Finally, shoreline access does not always correspond with the State's acquisition and/or enhancement process. DNR's Program Open Space primarily relies on Land Preservation and Recreation Plans, prepared and adopted at the local level, to select sites for acquisition. These plans reflect local priorities for public access and are used to guide allocation of State and local funds for enhancement. There is a need for coordination between local governments and the State to understand the county concerns regarding liability and management of access sites and to define a method to increase shoreline access.

Management Characterization

1. Within each of the management categories below, identify changes since the last assessment. This applies to both positive and negative changes.

Management Category	Changes since last assessment
Statutory, Regulatory, Legal Systems	none
Acquisition Programs	moderate
Comprehensive Access Planning	moderate
Operation & Maintenance Programs	none
Innovative Funding Techniques	none
Public Outreach and Education	moderate
Other	

2. For categories that are identified as significant or moderate provide the following information for each change: (1) Identify the change and whether it was a 309 change; (2) Briefly summarize the change; and (3) Characterize the effect of the change

***Acquisition Programs*.** The State of Maryland has a line item in its budget for continued acquisition of property that will provide public access to the Chesapeake Bay (Table 2). At both its 1996 and 2000 meetings, the Chesapeake Bay Executive Council reaffirmed the Bay Program's commitment to implement measures to provide public access to the Chesapeake Bay, its tributaries and streams, other parks and green spaces. Such measures may include acquiring and maintaining Bay, tributary, and park public access facilities. Operation of these facilities and maintenance of infrastructure at such facilities, including park and public landings, result in substantial local investments in facilities which support achievement of Bay Program objectives.

Table 2: Annual Maryland funding budgeted for Chesapeake Bay Access:

Fiscal Year	Allocated Funding
FY 1996	$2,845,500.00
FY 1997	$1,553,000.00
FY 1998	$1,000,000.00
FY 1999	$2,913,879.00
FY 2000	$3,895,250.00
Total	$12,207,269.00

The Rural Legacy Program was adopted in 1997 as part of the State's Smart Growth Initiative. Over the first five years of the Program's existence, the State has dedicated $82 million to preserve more that 38,000 acres. Additional information on this Program can be found in the Cumulative and Secondary Impacts section of the Assessment.

Public Education and Outreach. The Department of Natural Resources website has been enhanced since the last Assessment. It now includes information on public lands throughout the State including parks, forests, and recreational areas. Information can be found at www.dnr.state.md.us/publiclands. In addition, the Chesapeake Bay Program released an updated version of the "Chesapeake Bay, Susquehanna River, and Tidal Tributaries Public Access Guide" in 2000.

Comprehensive Access Planning. The Chesapeake Bay Agreement, originally adopted in 1983, formed a partnership between the States of Virginia, Maryland, and Pennsylvania, the District of Columbia, the Chesapeake Bay Commission, and the U.S. Environmental Protection Agency to protect and restore the Chesapeake Bay's ecosystem. In the year 2000, all signatories of the Bay Agreement reconfirmed their commitment to the partnership by adopting a renewed Bay Agreement. The Chesapeake 2000 Bay Agreement puts an increased emphasis on public access within the Chesapeake Bay, as demonstrated by the following commitments:

- By 2010, expand by 30 percent the system of public access points to the Bay, its tributaries and related resource sites in an environmentally sensitive manner by working with state and federal agencies, local governments and stakeholder organizations.

- By 2005, increase the number of designated water trails in the Chesapeake Bay region by 500 miles.

- Enhance interpretation materials that promote stewardship at natural, recreational, historical and cultural public access points within the Chesapeake Bay watershed.

- By 2003, develop partnerships with at least 30 sites to enhance place-based interpretation of Bay-related resources and themes and stimulate volunteer involvement in resource restoration and conservation.

Maryland is working through Program Open Space and other Department divisions to meet their portion of the goal. At this time it is felt that current programs are appropriate.

The Comprehensive Conservation and Management Plan of the Maryland Coastal Bays Program also includes public access initiatives. Within the Recreation and Navigation section Goal 5 states, "Improve water-based recreational opportunities and diversity of access to coastal bays and tributaries." This goal has two primary focuses to enhance recreational access, opportunities and diversity of access to coastal bays and tributaries and to increase public awareness of resource protection needs. Worcester County and the Maryland Coastal Bays Programs are the leads on these actions. Efforts were scheduled to begin in October 2000.

Maryland DNR and the Maryland Greenways Commission has produced a new Atlas of Maryland Greenways, Water Trails, and Green Infrastructure. The atlas identifies planned and existing water trails throughout the state as well as the green infrastructure and will be available via the internet as well as on CD. In addition, DNR and the Greenways Commission have produced new maps and publications on specific water trail projects and are co-sponsoring the Mid-Atlantic Governors' Conference on Greenways, Blueways, and Green Infrastructure, to be held September 2001 in Crystal City, VA.

Conclusion

1. Identify major gaps in addressing the programmatic objectives for this enhancement area.

Although there has been success providing public access within the coastal zone, the need for additional shoreline access is recognized. The current method for identifying acquisition sites does not make water access a priority. In fact, there are several issues which make shoreline access more difficult than inland or tributary access. These include: (1) the amount of private property along the shoreline, (2) the cost of property; (3) neighborhood concern; (4) property maintenance and liability; and (5) lack of a comprehensive plan that includes shoreline access as a focus.

One way to increase water access through an ongoing program is through implementation of the State's water trails. Although about 600 miles of water trails have been identified, only one is complete (Janes Island State Park), and a few more are in the implementation phase. Though state and county tourism officials would like to incorporate water trails into nature tourism promotions, there is limited money available for publication of brochures and for developing water trails (signage, put-ins). Progress on water trails is dependent on grant funding, primarily from two sources: the Chesapeake Gateways program and MDOT's Recreational Trails Funds. Both of these sources have fairly small amounts to work with.

2. What priority was this area and what priority is it now, in the view of the coastal program?

Last Assessment - High This Assessment - Medium

3. Briefly justify the proposed priority.

State of Maryland has assessed public access as a medium priority. Ongoing efforts, such as Program Open Space, Rural Legacy, and Water Trails have made land acquisition and public access a priority. In addition, both the Chesapeake Bay Program and the Coastal Bays Program are continuing efforts to increase efforts to the bays. Since acquisition programs are not funded under Section 309, other State funding sources will be used to continue these efforts. Besides state monies, the Coastal Zone Management Program will continue to work with Program Open Space to use Section 306A funds to provide public access within the coastal zone.

This Assessment did reveal a need to review how shoreline access can be improved. This is an issue at both the State and local level. At this time, the Maryland CZM Program does not feel that Section 309 funds are necessary in initiating this review. Instead, the CZM Program proposes using existing funds under Section 306, as well as efforts within both the Chesapeake Bay and Coastal Bays Programs, for this issue. Specific CZM efforts could include (1) sponsoring a Local Government Information Exchange to explore the obstacles, barriers, and liability issues which appear to be hindering public access opportunities; (2) working with the Coastal and Watershed Resources Advisory Committee to identify ways of improving public access opportunities; and (3) continuing communication with Program Open Space. If appropriate, Maryland may use 309 funding for this enhancement area in the future.

B. COASTAL HAZARDS

Section 309 Programmatic Objectives

I. Direct future public and private development and redevelopment away from hazardous areas, including the high hazard areas delineated as FEMA V-zones and areas vulnerable to inundation from sea and Great Lakes level rise.

II. Preserve and restore the protective functions of natural shorelines features such as beaches, dunes, and wetlands.

III. Prevent or minimize threats to existing populations and property from both episodic and chronic coastal hazards.

Coastal Hazards Characterization

1. Characterize the general level of risk in your state from the following coastal hazards:

Hazard	High Risk	Medium Risk	Low Risk
Hurricane/Typhoons	?		
Flooding	?		
Storm Surge	?		
Episodic Erosion	?		

Chronic Erosion	?		
Sea/Lake Level Rise	?		
Subsidence		?	
Earthquakes			?
Tsunamis			?
Other (specify)			

2. If the level of risk or state of knowledge about any of these hazards has changed since the last assessment, please explain. Also, identify any ongoing or planned efforts to develop quantitative measures for this issue area.
Overall, the level of risk for these coastal hazards has not changed; however, the level of understanding continues to change as indicated by a number of effort described below.

Flooding and Storm Damage: Projects identified in the Ocean City Water Resources Feasibility Study (OCWRFS) conducted by the US Army Corps of Engineers in partnership with the State of Maryland, Town of Ocean City, and Worcester County will have an impact on the level of risk of flooding and storm damage along the shoreline of Assateague Island and the bay shoreline of the communities and developments of West Ocean City and Worcester County. These projects include long term sand management on Assateague Island and at Ocean City, Maryland. Congress approved the appropriation of a portion of the federal funds through the Water Resources Development Act for the short term Assateague Island Beach Nourishment Project. Construction of this project would reduce the risk of flooding and wave damage on Assateague Island and the back bay shoreline. In addition to OCWRFS related work, the Maryland State Legislature approved the appropriation of funds to nourish approximately 2 miles of dunes at Assateague State Park. This project will reduce the risk of damage to park infrastructure.

Shore Erosion: The Governor appointed ***Shore Erosion Task Force*** was formed in 1999 to collect, review and discuss current knowledge and concerns and to make recommendations concerning shoreline erosion. The Task Force was charged with identifying shore erosion control needs by County in Maryland, clarifying local, State and federal roles regarding shore erosion, establishing 5- and 10-year plans, and reviewing contributing factors to shore erosion. Once implemented, the long range plan will identify hazardous areas in the Chesapeake Bay, Atlantic coastline and Coastal Bays regions, establish criteria and a priority system for the initiation of protective projects, delineate funding requirements and procedures and identify no action areas. The Task Force findings were presented to the Governor and State Legislature in January, 2000.

Information is being collected to aid in the improved planning for shore erosion management. Shoreline position maps for the entire state are being updated and digitized. From these maps, updated shore

erosion rates will then be calculated. Using some Section 309 funds, LIDAR (laser altimeter) topographic data will be collected for small stretches of shoreline in three counties. This information is more accurate than currently available topographic data and will be used to project future shoreline positions. The new shoreline positions will then be utilized to determine potential costs of impacted public and private infrastructure and other valuable resources. This information will be used as a public education and outreach tool and to develop mitigation strategies.

Sea Level Rise: Sea level rise is a significant factor contributing to shore erosion in the State of Maryland. Sea level rise contributes to coastal erosion by influencing and exacerbating on-going coastal processes, making coastal areas more vulnerable to extreme events. As sea level rises, storm surges will heighten and storm waves will extend further into the coastal zone, flooding homes, businesses, and roadways. Tide gauge measurements in the Chesapeake Bay and the Mid-Atlantic show rates of sea level rise nearly twice those of the global average. The average rate of sea level rise on Maryland's coastline has been 3-4 mm/yr, or approximately one foot per century. These rates are expected to accelerate due to global warming and may rise as much as 2 -3 feet along Maryland's shores by the year 2100. Relative sea level rise at a particular location is calculated by combining global (eustatic) sea level change and vertical land movement. Current research suggests that local land subsidence due to post-glacial crustal movement, sediment loading, and large scale tectonic activity is the factor contributing to the increased rate of sea level rise in Maryland.

3. Summarize the risks from inappropriate development in the state, e.g., life and property at risk, publicly funded infrastructure at risk, resources at risk.

Previous urban development along the Atlantic coast in Ocean City and the historical lack of a long term sand management plan put the shoreline of Ocean City and Assateague Island at risk. Destruction of dune features during significant storm events may continue to jeopardize the beach and infrastructure in Ocean City. However, this risk has been reduced due to the completion and subsequent maintenance of the Ocean City Beach Replenishment and Hurricane Protection Project. The Project provides protection from wave attack and storm surges from 100-year frequency storms through the periodic renourishment of beach sand to the Ocean City beach and dunal areas.

Construction of the Ocean City Inlet jetties in 1934 seriously impacted the shoreline of Assateague Island by diverting the littoral transport of sand from the island to the ebb shoal and the back bays. The construction of the Assateague Island Beach Nourishment Project and the Dune Nourishment Project at the Assateague State Park will provide some relief to the risk along the western shoreline of the Sinepuxent Bay. These projects may be constructed in the Spring, 2001. In addition, a sand bypass project which will remove shoaling sand in the inlet area and transport it to Assateague Island, is projected to begin in the Fall, 2001.

Increasing risk from coastal hazards in the Chesapeake Bay and its tributaries will continue due to

coastal erosion and storm events exacerbated by projected increases in sea level. It is currently estimated that 376 miles of Chesapeake Bay shoreline are eroding at greater than 2 ft/yr (up to 16 ft/yr) with development along the shoreline at greatest risk. Public facilities and infrastructure as well as vital coastal habitats are in danger of being degraded or completely destroyed. Coastal hazards in the Chesapeake Bay is epitomized by Smith Island, where coastal inundation is endangering several island towns as well as impacting critical habitats for Submerged Aquatic Vegetation and juvenile blue crabs. Current efforts to reduce coastal hazard risk include a reconnaissance report by the US Corps of Engineers (COE) and the initiation of a Feasibility Report by the COE in cooperation with its state and local partners. These reports investigate and analyze potential solutions and projects for hazard reduction.

Management Characterization

1. In the table below, indicate changes to the State's hazards protection programs since the last assessment.

Mechanism	**Changes since Last Assessment**
Building restriction	None
Repair/rebuilding restrictions	None
Restrict "hard" shoreline protection structures	None
Restrict renovation of shoreline protection structure.	None
Beach/dune protection	Moderate
Permit compliance program	None
Inlet management plans	Moderate
SAMPs	Significant
Local hazards mitigation planning	Significant
Innovative procedures for dealing with takings	None
Methodologies for determining setbacks	None
Disclosure requirements	None
Publicly funded infrastructure restrictions	None
Public Education and Outreach	**Moderate**
Other: Response strategies, long-range planning	**Significant**

2. For categories with changes that are identified as significant or moderate provide the following information for each change: (1) Identify the change & whether it was a 309 change; (2) Briefly summarize the change; and (3) Characterize the effect of the change.

***Beach/dune protection*.** The emergency, short term protection of Assateague Island is underway with placement of sand materials along the northern shoreline of the island. The long term nourishment

of Assateague Island will provide relief from the effects of beach loss due to littoral movement of sand and storm events. The proposed project will place approximately 150,000 cubic yards of sand onto the shoreline annually. This amount is approximately equal to the annual loss of sand due to natural processes. This is not a Section 309 change.

Inlet Management Plans. The OCWRFS identified projects to deepen and widen the Ocean City Inlet and provide long term nourishment of Assateague Island. This is not a Section 309 change. The project will improve navigation through the inlet into the Ocean City Harbor. Funding for the project is expected to be available in 2001. The Army Corps of Engineers has proposed significant restoration of the outer 1200 ft of the south jetty of the Ocean City Inlet. Funding for this project has not yet been identified.

SAMPs. The Comprehensive Conservation and Management Plan for Maryland's Coastal Bays was finalized in June, 1999. The development of the Plan was facilitated by the Maryland Coastal Bays Program which was established in 1996 to assist the region in working toward restoring and protecting Maryland's Coastal Bays. The Plan serves as a blueprint for public agencies responsible for protecting the natural resources of the Coastal Bays watershed. It also serves as a tool for interested citizens to track and engage in the listed actions and strategies. These actions include improving the management of navigation and dredging issues, reducing resource damage from oil and hazardous material spills, enhancing natural disaster planning, and reducing shoreline erosion. Elements outlined in the natural disaster planning section call for amending local floodplain ordinances; changing local codes based on shoreline erosion and sea level rise projections; improved development siting, design and construction; and improved local evacuation plans. These actions are all designed to reduce flooding and storm damage loss and impacts to local communities of the coastal bays.

Local Hazard Mitigation Planning. A risk analysis recently conducted by the Maryland Emergency Management Agency (MEMA) identified coastal flooding as a risk for ten of the State's sixteen coastal counties.[1] In addition, eleven local jurisdictions were characterized as storm surge risk zones.[2] The completion of the risk assessment is the first step in the process of developing State-wide and local hazard mitigation plans, a process currently underway in Maryland. The federal government requires State and local jurisdictions to adopt hazard mitigation plans in order to be eligible for hazard mitigation funding. While every coastal county has adopted a floodplain management ordinance, a requirement for participation in the National Flood Insurance Program, not every coastal county has adopted a hazard mitigation plan. Additionally, most of the local plans that do exist are not

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[1] Risk is classified "high", "medium-high" and "medium." High risk counties include: Worcester and Dorchester; medium-high: Talbot, Queen Anne's and Kent; and, medium: Charles, St. Mary's, Somerset, Wicomico, and Baltimore.

[2] Storm surge risk zones are also classified "high", "medium-high" and "medium." High risk jurisdictions include: Dorchester County, St. Mary's County and Ocean City; medium-high: Worcester and Talbot Counties; and medium: Wicomico, Somerset, Queen Anne's, Kent, and Anne Arundel Counties.

comprehensive in nature and many are out of date. Section 309 activities began in FFY2000 and will continue through the next 5-year Section 309 Strategy.

Public Education and Outreach and Long Range Planning. The Shore Erosion Control Task Force developed a set of recommendations addressing coastal erosion issues in the state and submitted them to the state legislature and the Governor in early 2000. These recommendations will be used as the foundation in the development of a statewide Comprehensive Shore Erosion Management Plan for Maryland. In addition, a document outlining Sea Level Rise Response Strategies for Maryland was finalized in 2000. The information and recommendations outlined in this document will be incorporated into the Shore Erosion Control Management Plan where appropriate. Public education and outreach efforts related to both the development of the statewide Shore Erosion Control Plan and sea level rise issues are ongoing. Section 309 related changes will be pursued within the 5 year development window for the Shore Erosion Control Plan. Section 309 funding for FY2000 is being used to support DNR in its commitment to initiate development of particular elements of the Comprehensive Plan in two coastal counties, St. Mary's and Dorchester. For more information see page 13 of this Assessment.

2. Discuss significant impediments to meeting the 309 programmatic objectives; e.g., lack of data, lack of technology, lack of funding, legal defensibility, inadequate policies, inadequate implementation of policies, lack of political will, lack of public understanding, lack of public acceptance.

The objectives are currently being met in Ocean City through the beach replenishment project. The state and local partners involved in the Ocean City and Vicinity Water Resources Feasibility Study and the Maryland Coastal Bays Program are working toward addressing the significant impediments to meeting the Section 309 objectives in the rest of the coastal bays. Efforts to improve the management of shoreline development are moving ahead slowly, however, the progress is hampered by inadequate implementation of policies, lack of funding, and the lack of public understanding and acceptance. The restoration and protection of Assateague Island National Seashore and the Assateague Island State Park will provide some protection to the western shore of Sinepuxent Bay because the island will be wider and higher in elevation.

The areas around the Chesapeake Bay and the Coastal Bays that are subject to erosion will be addressed through the Shoreline Erosion Control Program to the extent that funding is made available and, in the near future, through the provisions of a Comprehensive Shore Erosion Control Plan for Maryland. Maryland loses approximately 260 acres of tidal shoreline to erosion annually. Coastal erosion and inundation are impacting public and private property, historic and cultural sites, recreational beaches, productive farmland, wetlands, and forested areas. The relative rate of sea level rise in Maryland is nearly twice the global average and is expected to accelerate in the future.

Up to date information and data are needed to accurately project and plan for both erosion and sea level rise. Currently, adequate topographic data for nearshore and low-lying areas is not available to the level needed for the development of a sea level rise elevation model and the subsequent analysis and identification of threatened areas. In addition, a lack of technology exists in the analysis of the efficacy

and appropriateness of certain shore erosion control methods. A combination of primary research, literature searches and cooperative analysis with federal and local agencies and other states is needed to compile this information. Efforts must also address public outreach to increase the general understanding and acceptance of mitigative measures associated with sea level rise and shore erosion impacts. Additional attention and resources are needed to develop strategies which will reduce the potential for catastrophic losses in coastal areas.

Conclusion

1. Identify major gaps in addressing the programmatic objectives for this enhancement area.

Comprehensive Planning for Shore Erosion Control. Based on available data, approximately 31% of Maryland's shoreline is experiencing some level of erosion. Current erosion control efforts are reactionary and not based on a long term plan which would targets efforts in a more comprehensive manner. Limited resources, including personnel and financial support, require a comprehensive analysis of shoreline conditions on a regional basis. This would allow the State to efficiently target shore erosion control funding and efforts toward areas exhibiting critical erosion rates and/or areas having significant public value and investments. In order to correctly target areas in need of shoreline protection, data and information must be collected and analyzed and priorities must be established. Conditions which will be considered in targeting areas for protection include high rates of erosion; public investment and infrastructure; critical habitat for endangered or threatened species and other environmental conditions; connectedness to other state, federal or local land conservation programs; and historical values. The development of a comprehensive approach to managing for shoreline erosion control is critical to equitable and effective coastal management. Coordination with local municipalities and regional entities in the development and execution of regional approaches to shore erosion control must be fostered. These regional approaches will be incorporated into the statewide comprehensive plan to address shore erosion control needs throughout the state. Associated with this local coordination is the continuance and further development of public outreach and education activities.

Sea Level Rise Response Strategies. The average rate of sea level rise along Maryland's coastline is 3-4 mm/yr or approximately 1 ft per century. This rate is nearly double that of the global average, probably due to local land subsidence. In addition, research indicates that global warming may increase this rate, resulting in a rise of 2-3 ft by the year 2100. Existing state and local directives and planning in Maryland do not sufficiently address the effects of projected sea level rise. Additional efforts in outreach, technical and data collection, application to local and state planning mechanisms, and the development of statewide policy initiatives are needed to reduce the risks associated with sea level rise.

Local Hazard Mitigation Planning. The process of developing a hazard mitigation plan is an excellent opportunity to enhance planning for the hazards associated with sea level rise (e.g., coastal flooding, storm surge, and shore erosion) at the local level. Local hazard mitigation planning is perhaps the most comprehensive method to implement measures to protect public safety, health and general welfare in the event of increased storm damage resulting from sea level rise. The State should make every effort to promote consideration of sea level rise and other coastal hazard issues during the development of Local Hazard Mitigation Plans. Agency personnel with expertise in coastal hazard and sea level rise mitigation should participate on the hazard mitigation teams of those coastal counties with

a heightened risk of coastal flooding and storm surge.

2. What priority was this area and what priority is it now, in the view of the coastal program?

Last Assessment - High This Assessment - High

3. Briefly justify the proposed priority ranking.

Coastal Hazards remain a high priority for the State. Recent major activities within the State include: (1) work in the Coastal Bays region through the Coastal Bays Program; (2) the Ocean City, MD and Vicinity Water Resources Feasibility Study effort in coordination with the Corps of Engineers and local government; and (3) the development of the Shore Erosion Task Force efforts and recommendations in Maryland's coastal counties. Further development and coordination of strategies associated with sea level rise, local hazard plans and the shore erosion control plan will be critical to developing a sound approach to managing for coastal hazards in Maryland in order to reduce these exposure level and assist in community planning. In order to complete these effort, funding, data and technical assistance are needed. Maryland believes that CZM Section 309 funds are appropriate to use in this effort.

C. OCEAN RESOURCES

Section 309 Programmatic Objectives

I. Develop and enhance regulatory, planning, and intra-governmental coordination mechanisms to provide meaningful governmental coordination mechanisms to provide meaningful state participation in ocean resource management and decision-making processes.

II. Where necessary and appropriate, develop a comprehensive ocean resource management plan that provides for the balanced use and development of ocean resources, coordination of existing authorities, and minimization of use conflicts. These plans should consider, where appropriate, the effects of activities and uses on threatened and endangered species and their critical habitats.

Resource Characterization

1. In the table below, characterize ocean resources and uses of state concern and specify existing and future threats or use conflicts.

Resource or Use	Threat or Conflict	Degree of threat	Anticipated threat or conflict
Beach sand	recreation and development	High	over development in the Coastal Bays region without sound conservation practices
Offshore Sand	mining	Low	impact on habitats; competition with industry
Heavy minerals	mining	Low	impact on habitats
Fisheries	overfishing	Medium to High	reduced stocks, user conflicts
	development	Medium to High	Habitat degradation (i.e. water quality, submerged aquatic vegetation, bottom habitat)
	pollution	Low to Medium	disease, fish kills, increased nutrients

	channel dredging	Low to Medium	habitat loss
	fishing gear impacts	Low to High	SAV loss, bycatch mortaliy
Oil and Gas	spills, leasing	Low to Medium	impact on habitat

2. Describe any changes in the resources or relative threat to the resources since the last assessment.

Beach and Offshore Sand: The Maryland and Delaware Geological Surveys, in cooperation with the U.S. Minerals Management Service, have identified all of the major sand deposits within state waters and federal waters out to twelve miles offshore. Instate offshore sand resources suitable for beach nourishment will most likely be depleted by projects in Ocean City within fifty years. Therefore the State will increasingly rely on sand deposits in federal waters for beach replenishment.

MGS has identified three shoals off Fenwick Island, in federal waters, that contain sand suitable for beach fill. Of these three, Fenwick and Weaver Shoals are closest to the shore and contain the best quality sand. Isle of Wight Shoal is farther from shore and contains somewhat finer material than the other shoals. Several shoals off Assateague Island also contain useable sand. Great Gull Bank, in federal waters, is currently being used for nourishment projects on northern Assateague.

The U.S. Minerals Management Service has conducted two comprehensive environmental assessments on Fenwick and Weaver Shoals and as recommended by MGS, the U.S. Army Corps of Engineers has produced an environmental impact statement for Great Gull Bank. The results of these studies state that sand mining on these shoals will have minimal and largely temporary or reversible effects on fish and benthic habitats, fishing resources, and shoreline wave climates. These effects will be minimized by proper mining techniques and timing. It has been demonstrated that proper mining techniques can beneficially increase the roughness of bottom topography which in turn enhances fish habitat.

Heavy Minerals: Studies conducted by MGS indicate that there is a low potential for the existence of economic heavy mineral deposits off Maryland's coast. Dropping heavy mineral mining from the above table is justifiable.

Fisheries: Maryland Department of Natural Resources, in cooperation with the Chesapeake Bay Program, Atlantic States Marine Fisheries Commission, and National Marine Fisheries Service Mid-Atlantic Fisheries Management Council, is responsible for managing Maryland's fisheries resources. Fishery management plans exist for those species that serve an economical, recreational, ecological and sociological importance to Maryland. The changes to these fisheries has varied significantly since 1997. Several fishery resources have improved in recent years (i.e. striped bass), many are improving (i.e. summer flounder, black sea bass), and some have decreased in abundance (i.e. blue crabs). The threats to these resources also varies significantly, ranging from overfishing to habitat degradation. The changes and threats to fisheries resources are extremely dynamic. The establishment of fishery management plans which are reviewed annually enable the management bodies to address these changes in a timely manner.

Oil and Gas: Maryland does not permit oil or gas drilling in its coastal waters. However, since the last Section 309 Assessment, the State has experienced concern over the transport and piping of these resources. This was of particular concern after a pipe break in the Patuxent River. That State has begun to look more closely at cleanup and recovery methods.

One primary frontier area is of concern for Maryland, the Baltimore Canyon Trough. This is a submerged geological depression extending 300 miles parallel to the coastline from Long Island to the vicinity of Cape Hatteras. Interest has been shown in a series of fossil coral reefs in this area, approximately 100 miles off the coast of Maryland. Based on geophysical estimates of hydro carbon potential, lease sales have been held in this region. However, no oil or natural gas reserves that are economically feasible to extract have been discovered by exploratory drilling. Maryland wants to be able to set conditions and help determine how lease sales are made. This may be an increasing issue in the next five years.

Management Characterization

1. In the table below, identify state ocean management programs and initiatives developed since the last assessment.

Program	Status	309$
Statewide comprehensive ocean management statute	No	0
Statewide comprehensive ocean management plan	No	0
Single purpose statutes related to ocean resources	No	0
Statewide ocean resource planning/working groups	No	0
Regional ocean resources planning efforts	Yes	0
Ocean resources mapping or information system	Yes	0
Dredged material management planning	No	0
Habitat research, assessment, monitoring	Yes	0
Public education and outreach efforts	Yes	0
Other	No	0

2. For the changes identified above, briefly summarize the exact change and its effects.

Regional planning, resource mapping and habitat assessment. Maryland Geological Survey has identified and characterized sand resources that are most likely to be used for both beach nourishment projects and commercial mining in Maryland. The U.S. Minerals Management (MMS) and U.S. Army Corps of Engineers (USACE) have been investigating the environmental impact of sand mining in these sand deposits. Environmental assessments of these regions were published in 1999 by both MMS and USACE, and another is due in 2000 from MMS. MMS is developing a management plan for the mining of these resources and restoration of post-mined regions. This pro-active stance will make sand more readily available in times of emergency. Federal law has been changed so that state and local governments are no longer required to purchase sand from the federal government, however a lease

must still be obtained. MGS is investigating changing patterns in sand usage and needs along the coast.

Public Education and Outreach Options: Public education and outreach is essential for managing Maryland's fishery resources successfully. Programs have been developed to educate the public on fishing regulations, fishing opportunities, and to promote a stewardship ethic to Maryland's natural resources. Maryland DNR has significantly improved their Fisheries Service website which continues to receive outstanding recognition by the public. Several brochures have been developed informing the public of fishing regulations, etc... MD DNR also has an expanding natural resources outreach program which devotes most of its time working with school kids.

Conclusion

1. Identify major gaps in meeting the programmatic objectives for this enhancement area.
Current beach sand management techniques should be reexamined. Sand on existing beaches and in the in-shore is often overlooked as a primary resource for restoration or protection efforts. Conservation and construction practices and sand recycling methods should be evaluated for minimizing storm damage on existing property and decreasing the dependence on offshore sand. Recovery of sand from the near-shore and inlet areas in the Coastal Bays and recycling to the beach are options which should be more closely examined. Also, as our knowledge of dredging-related environmental issues matures, we need to address ways of improving sand management once it is placed on the beach.

While the commercial development of offshore sand resources is not currently an issue, it is reasonable to assume that as on-shore resources dwindle, increasing interest will focus on offshore sites.

2. What priority was this area and what priority is it now, in the view of the coastal program?
Last Assessment - Medium This Assessment - Medium

3. Briefly justify the proposed ranking.
Management of ocean resources, including sand, heavy minerals, fisheries, and oil and gas, continues to be a medium priority for Maryland. Though these resources are considered of high importance for the State, management efforts and programs are already in place. Examples of ongoing activities that will support ocean resources include: work has been done to identify and manage offshore sand sources and to make these resources available quickly in response to sudden need; studies on the effects of sand mining on both the region's biological habitats and recreational/commercial activities; creation of fishery management plans for the Maryland coastal bays; and efforts to improve response to oil spills. As a result, Section 309 funds are not needed to support this enhancement area at this time.

In addition, no significant changes in state policy with regard to off-shore sand resources is expected in the near future. And, the most recent studies and evaluation indicate that remaining, significant offshore sand sources lie in federal waters. Since management of these resources would be a federal concern, Maryland would not require Section 309 funding in the immediate future to address this issue.

D. WETLANDS

Section 309 Programmatic Objectives

I Protect and preserve existing wetlands, as measured by acreage and functions, from direct, indirect and cumulative adverse impacts, by developing or improving regulatory programs.

II Increase acres and associated functions (e.g., fish and wildlife habitat, water quality protection, flood protection) of restored wetlands, including restoration and monitoring of habitat for threatened and endangered species.

III Utilize non-regulatory and innovative techniques to provide for the protection and acquisition of coastal wetlands.

IV Develop and improve wetlands creation programs as the lowest priority.

Resource Characterization

1. Extent of coastal wetlands

Wetlands	Extent (acres and year)[1]	Trends (+/- acres/year)
Tidal	261,309 (2000)	Average gain over the past several years is approximately 6 acres, including mitigation and marsh creation. Marsh creation is generally counted toward the State's voluntary goal of restoring 60,000 acres of wetlands.
Non-Tidal	305,609 (2000)	The "no net loss" of wetlands through the regulatory program has resulted in an average annual gain of 27 acres. This is due to mitigation.
Freshwater	344,172[2] (1995)	As mentioned under tidal and nontidal there has been an increase in freshwater wetlands, which includes all nontidal wetlands and 38,563 acres of vegetated tidal freshwater wetlands.
Publicly Acquired (Protected) Wetlands	146,701[3] (2000)	Maryland has purchased several tracks of land which contain wetlands. These include Chapman's Landing, Baldwin's Choice and Chesapeake Forests.
Restored Wetlands	4,800 (2000)	Since 1998, approximately 4,800 acres of wetlands have been restored through voluntary programs. Complete results for 2000 are still being compiled.

[1] Acreage extent for estuarine (tidal) and palustrine (nontidal) wetlands in the coastal plain. U.S. Fish and Wildlife Service and Maryland Department of Natural Resources, *Wetlands of Maryland* (1995). As discussed above, more accurate figures currently are being generated by DNR's Geographic Information Service.

[2] This includes all non-tidal wetlands and 38,563 vegetated tidal freshwater wetlands based on an estimate from *Wetlands of Maryland* (1995).

[3] Publicly acquired or "protected wetlands" were defined as all publically and privately owned lands within Maryland that fall under Management Status 1-3 or Maryland Environmental Trust Easements within the coastal zone. The acreage can be divided into tidal (101,051 acres) and nontidal (45,650 acres).

2. Direct and indirect threats to coastal wetlands, both natural and man-made.

Threat	Significance-Tidal	Significance-Nontidal
Development/fill	low	medium/low
Erosion	high/medium	medium
Pollution	low	medium
Channelization	low	low
Nuisance or Exotic Species	high/ medium	medium

Freshwater Input	low	low
Other Fragmentation	N/A	medium

3. For threats that are identified as high or medium, provide the following information: (1) Characterize the scope of the threat; (2) Describe recent trends; (3) Identify impediments to addressing the threat.

Nontidal Wetlands

Development/Fill. Direct threats to coastal nontidal wetlands have been greatly reduced by implementation of the Nontidal Wetlands Protection Act. Statewide losses from wetlands permitting (i.e., excluding gains through mitigation) average approximately 35 acres per year, with the majority of the wetlands being lost in the coastal zone. In the past, wetlands were often drained for agricultural purposes, now build-out of old subdivisions, highway projects and other major public works and development projects are the main causes of loss on both the eastern and western shore. To minimize the loss of wetlands from development, the State is promoting watershed approach described in the management section of this wetlands assessment.

Erosion. Many areas on the Western Shore have erodible soils that are sensitive to direct and indirect impacts. The increased runoff generated from development entering streams often results in incised stream channels and degraded conditions for aquatic life. Wetlands adjacent to these incised channels flood less frequently and may be draining due to the lower water level in the stream.

Pollution and Nuisance/Exotic Species. These threats are closely linked. Pollution in the form of trash and runoff often are followed by nuisance or exotic species indicative of a disturbed area. The function that is most affected is habitat. Nuisance and exotic species may overwhelm native species and replace the plant community that provides preferable food sources and cover. Lack of staff is an important barrier to developing guidelines, control, and cleanup strategies. Another factor is limited financial incentives for property owners to manage nuisance and exotic species.

Fragmentation. Wetland and stream systems and their forested buffers form corridors for wildlife, system integrity, and other functions when adjacent land use is not intensive. As areas become more urban, roads and utility lines frequently cross and fragment the wetland systems. While structures may physically avoid wetlands and streams, the wetland system's ability to perform functions is impaired if there is insufficient buffer area to maintain a corridor. Watershed management plans and a Statewide wetland conservation plan would help maintain critical habitat.

Tidal Wetlands

Erosion. One of the greatest threat to Maryland's tidal wetlands continues to be shoreline erosion (in combination with inundation through flooding). DNR estimates that the State loses 260 acres of tidal shoreline to erosion each year, a portion of which include tidal wetlands acreage. Erosional losses are a direct result of the location of wetlands on and in close proximity of main stem of the Chesapeake Bay, which in many areas is characterized by extensive fetches and high-energy conditions. In 2000, the document *A Sea Level Rise Response Strategy for the State of Maryland* describes the effect of sea

level wise on wetlands and marshes. These effects include erosion of wetland edges and submergence of marshes (additional information can be found under the coastal hazards enhancement area). Though these processes have natural components and are have an important role in the movement of substrate, human influences such as development have increased both their rates and the need for management.

Nuisance Species. The greatest threat to wetlands as a result of nuisance species is the invasion by *Phragmites australis*. *Phragmites* tends to monotypically colonize high marshes. While these areas typically remain wetlands and perform many of the desirable wetland functions, the values for habitat and detrital input are significantly diminished. Maryland currently operates a technical assistance and cost-share program to assist property owners in managing *Phragmites*.

In addition, Nutria can cause large "eat outs" which over time become devoid of vegetation, enlarge, coalesce, and result in the formation of interior ponds. Once ponds reach one acre or more in size, further expansion of the pond is driven by erosion, particularly during storm events. Nutria have been identified as a particular concern in the Blackwater Wildlife refuge on the eastern shore, where they were first identified in 1943. Since 1970, populations in the marsh have increased, as has the rapid degradation of marshes in the Refuge. The general scientific consensus is that Nutria are not the major, or primary cause of marsh loss, but that they are a contributing cause, a catalyst, or a trigger, which may be accelerating marsh loss due to other on-going natural processes.

Management Characterization

Within each of the management categories below, identify changes since the last assessment. This applies both to positive and negative changes.

Management Category	Changes Since Last Assessment
Regulatory Programs	none
Wetlands Protection Standards	moderate
Assessment Methodologies	moderate
Impact Analysis	none
Restoration/Enhancement Programs	moderate
SAMP's	moderate
Education/Outreach	moderate
Wetland Creation Programs	moderate
Acquisition Programs	moderate
Other: Comprehensive Planning	significant

For categories with changes that are identified as significant or moderate provide the following information for each change: (1) Identify the change & whether it was a 309 change; (2) Briefly summarize the change; (3) Characterize the effect of the change.

Assessment Methodologies. Accurate data is a key to managing wetlands. Data facilitates the permitting process, aids in a variety of planning and research needs, provides public officials and private citizens advance notice of where on-site delineations might be necessary, and enhances any decisions either affecting or affected by an area's specific drainage, habitat, or water quality characteristics (e.g., decisions represented by wetlands of special state concern, local comprehensive plans, septic districts, conservation easements, and greenway corridors). Currently, state officials, building in part on U.S. Fish and Wildlife National Wetlands Inventory data, have re-delineated approximately one-half of the

state's wetlands through the development of non-tidal wetlands guidance maps that are more accurate than previous inventories, including the NWI data reflected in *Wetlands of Maryland* (U.S. Fish and Wildlife Service and Maryland DNR, 1995). As part of this effort, representatives from Maryland Department of the Environment (MDE) and DNR are participating on the Wetland Data Coordination Working Group of the Federal Geographic Data Committee, Wetlands Subcommittee, which is implementing a strategy to better coordinate government collection of wetland data used to characterize the status and trends of wetlands resources.

In addition, the Departments of Environment and Natural Resources collaborated on a database of wetland, water, and natural resources information. The database allows information to be searched by watershed and was designed as a tool for local governments to obtain existing information on water and natural resources.

Wetland Protection Standards. As noted in the 1997 Assessment, MDE's Nontidal Wetlands and Waterways Division (NWWD) has identified certain activities with minimal adverse wetlands impacts. Under certain conditions, these wetlands qualify for expedited permitting when property owners agree to implement best management practices. Two approaches were developed to reduce the administrative requirements for conducting these activities: (1) entering into agreements with utility companies and local governments and (2) developing a series of general permits. The agreements have since expired and the proposed general permits were rejected; however, the Division has utilized its existing authority to combine these approaches. Regional Letters of Authorization (RLOA) were issued to utility companies and federal, State and local government agencies for specific activities that have minimal adverse impact to wetlands and are conducted repeatedly by the permittee. Most are for maintenance and repair activities; however, notable exceptions are the RLOA issued to the U.S. Fish and Wildlife Service, Natural Resources Conservation Service, and Ducks Unlimited for wetland restoration and enhancement under Partners for Wildlife and similar programs. As with the previous agreements, certain conditions must be satisfied and best management practices applied. The RLOA's are generally valid for one year and require satisfactory performance and reporting before a new RLOA is issued. When waters of the State are involved, the General Waterway Construction Permit (GWCP) must be applied alone or in conjunction with the RLOA. The GWCP requires the submission of plans at least 30 days in advance of the planned construction.

Wetlands Restoration, Enhancement, and Creation Programs. Maryland has met and exceeded its goal of achieving "no net loss" of wetlands through its mitigation requirements. Approximately 78.68 acres of wetlands have been established by the NWWD and 318.83 acres are being established through permittees. When the above mitigation and State projects are excluded, net wetland gain is approximately 89.93 acres through June 30, 2000.

In May, 1997, Governor Glendening established a Wetlands Restoration Initiative calling for a cooperative and voluntary effort by all levels of government, businesses, industries, environmental groups, community organizations, and individual citizens to restore 60,000 acres of Maryland's tidal and nontidal wetlands. A steering committee of business, agricultural, environmental and civic community leaders and federal, state and local government officials has been appointed by the

Governor to make recommendations on meeting the voluntary restoration goal and recommend incentives for wetland creation. Concurrently, DNR, MDE and the Maryland Department of Agriculture have developed a Referral Service to bring landowners wishing to enhance the environmental features of their property together with government agencies and conservation groups searching for opportunities to create, restore and enhance terrestrial and aquatic habitats. In 2000, the Governor signed the Chesapeake Bay Agreement 2000, which has an interim goal of restoring 25,000 acres of wetlands by 2010. Maryland's portion of this goal is 15,000 acres. In addition, the Coastal Bays Comprehensive Conservation Management Plan has a restoration goal of 10,000 acres in the Coastal Bays watershed. Maryland is on schedule for meeting both of these goals with approximately 4,800 acres of wetlands restored through late 2002. Furthermore, the State Highway Administration has committed TEA-21 funds to assist in the State's restoration efforts.

Special Area Management Plans (SAMPs). NWWD continues to work with the US Army Corps of Engineers and Baltimore County to develop and plan several SAMPs (not Section 309). Similarly, Anne Arundel County has enlisted this regional planning concept for the Odenton Town Center. These efforts are consistent with the Division's promotion of watershed management plans to guide permit decisions and improve management of wetland/water resources. Additional information on watershed management planning efforts is provided in the Section 309 Accomplishments section.

Education/Outreach. MDE has developed a Wetlands web site (www.mde.state.md.us) that will provide Marylanders with information on both regulatory and non-regulatory programs. Application and public notice information is available online. There are also extensive technical and educational documents related to wetlands and waterway management. Information on funding assistance and other related regulatory and non regulatory programs is also available.

Comprehensive Planning. The State is promoting watershed plans with a wetland/water resources component and preparing a Statewide wetland conservation plan to provide more comprehensive management of wetlands and water resources. The watershed plans are developed in cooperation with local governments and specifically protect wetlands by incorporating them into a jurisdiction's land use decisions. To date, watershed plans have been adopted for the Big Annemessex River watershed in Somerset County and initiated in Baltimore, Calvert and Montgomery Counties. In addition, a more comprehensive approach for combining stormwater retrofit projects with stream restoration is now being promoted through new stormwater management regulations. Due to staff limitations, comprehensive or other watershed approaches are not being encouraged or developed to the greatest extent possible, though increased effort will be made as a result of the Chesapeake Bay Agreement 2000 and the Comprehensive Coastal Bays Management Plan(CCMP).

The Chesapeake Bay 2000 Agreement has four primary wetland goals: (1) achieve no-net loss of wetlands acreage and function; (2) by 2010, achieve a net gain by restoring 25,000 acres of tidal and non-tidal wetlands; (3) provide information and assistance to local governments and community groups to develop and implement wetlands preservation plans as part of locally based integrated watershed management plans; and (4) evaluate the potential impact of climate change on the Chesapeake Bay watershed. As mentioned above, efforts have begun on developing watershed-based wetland plans.

In addition, MDE held an initial conference on the relationship between climate change and wetlands in December, 2000.

It is estimated that over 1,500 acres of tidal wetlands have been lost in the coastal bays watershed due to shoreline development and stabilization. In addition, approximately 51,000 acres of forested wetlands have been lost. Several actions in the Coastal Bays CCMP are designed to help protect existing wetlands and create new wetlands. Specific goals include: (1) increasing the amount of wetlands by 10,000 acres; (2) protecting existing wetlands and, where impacts cannot be avoided, encouraging private wetland mitigation; and (3) evaluating wetland management efforts.

In response to citizen concerns over the State's capacity to control shoreline erosion, the Maryland General Assembly passed Resolution 13 in May 1999 requesting that the Governor establish a Shore Erosion Task Force representing State and local government, the scientific community, and citizens at large. A major component of the Comprehensive Plan will be the establishment of regional shore erosion control strategies. It is anticipated that strategies will include the designation of non-structural and structural shore protection areas, natural shore erosion areas, areas where erosion-based setbacks should be implemented, and areas to target for land conservation. The designation of such areas will significantly advance management of issues associated with shoreline erosion and tidal wetland loss. For more information see the Coastal Hazards Assessment.

Acquistion/Incentive Programs.
The Conservation Reserve Enhancement Program (CREP) is a Maryland-specific enhancement of the USDA's Conservation Reserve Program. CREP provides payments above the normal rental rates for establishing riparian forest or grass buffers, planting permanent cover on highly erodible lands, and restoring wetlands. CREP is administered through the USDA Farm Service Agency with technical support from soil conservation districts, and the Natural Resources Conservation Service.

CREP is a voluntary program that offers landowners payments for installing conservation practices on their land. Participants receive annual rental rates comparable to county soil rental rates plus an incentive bonus. There is a 50% bonus for restoring wetlands. In addition, there is a 75% cost-share for the establishment of wetlands. It is also possible to sell permanent easements on acres in CREP practice plus some adjacent existing buffers of wetlands.

Conclusion

1. Identify major gaps in addressing the programmatic objectives for this enhancement area.
Increase levels of wetlands sustainable acreage and functions within degraded wetlands.
Maryland is exceeding its "no net loss" goal as a result of non-regulatory efforts that have increased the total level of wetland acreage. These non-regulatory efforts generally focus on wetlands creation projects. Making wetland creation projects a priority leaves a gap in wetlands protection and enhancement. Additional effort needs to be made to preserve and enhance existing wetland acreage, rather than concentrating on new sites.

Placement of wetland restoration initiatives. The State prefers to use the restoration of original wetlands sites to meet "no net loss" goals. These restoration efforts usually require less engineering and excavation and therefore are more financially feasible. However, these site are often located in agricultural areas. The result is that restoring lands to wetlands can often result in the loss of productive farmland. There is a need to identify more potential wetland sites that will not influence agricultural lands, including floodplains.

2. What priority was this area and what priority is it now, in the view of the coastal program?

Last Assessment - High This Assessment - Medium

3. Briefly justify the proposed priority.

Wetlands regulation and management are a medium priority. Previously overlapping State regulatory programs have been streamlined and consolidated. "No net loss" of acreage and function has been achieved through the regulatory program. The State, through Governor Glendening's Wetland Restoration Initiative, continues to increase its non-regulatory efforts to create, restore and enhance wetlands. Watershed planning and the State Wetland Conservation Plan continue to be high priorities for Maryland. In addition, both the Chesapeake 2000 Agreement and Coastal Bays Comprehensive Conservation Management Plan contain wetland initiatives. Because of the many management efforts already in place, it is believed that the state wetland goals and initiatives can be met through existing programs and funding sources.

E. CUMULATIVE AND SECONDARY IMPACTS

Section 309 Programmatic Objective

I Develop, revise or enhance procedures or policies to provide cumulative and secondary impact controls.

Resource Characterization

1. Identify areas in the coastal zone where rapid growth or changes in land use require improved management of CSI. Provide the following information for each area: (1) type of growth or change in land use (i.e., residential, industrial, etc...); (2) rate of growth or change in land use; (3) types of CSIs

According to projections prepared by the Maryland Office of Planning, population will increase from five million (1995) to six million by the year 2020, a 20% increase. Households are estimated to increase 26% from 1.9 million to 2.4 million. And though the number of people per household has decreased from 3.57 to 2.72 over the last 50 years, the amount of land that each individual home consumes has increased by almost 60 percent. The largest increase in population is expected to occur in the Baltimore-Washington metropolitan area. However, balancing growth with natural resources is an issue throughout the State.

In 1998, Maryland reviewed all watersheds within the state in accordance with the Federal Clean Water Action Plan (CWAP). The Unified Watershed Assessment (UWA) used the best available

information to assess the condition of each state 8-digit watershed. The analysis identified those watersheds which were in need of restoration and/or protection. Watersheds were then prioritized based on need. Using a variety of environmental and watershed indicators, a total of 43 priority category 1 watersheds were identified in the coastal zone. At least one priority watershed was identified in each of the 16 coastal zone counties. These watersheds and some of the associated indicators are listed in the table below.

Coastal County	**Priority Category 1 Watersheds**	**Indicators**[1]
Anne Arundel	Patuxent River Upper*, South River, Little Patuxent River*, Severn River, Bodkin Creek, Baltimore Harbor*, Patuxent River Middle*	submerged aquatic vegetation (SAV), population density, stream indicators, nutrients, impervious surface
Baltimore City	Baltimore Harbor*, Gwynns Falls*, Jones Falls*, Back River*	nutrients, SAV, impervious surface, stream buffers, population density
Baltimore County	Baltimore Harbor*, Gwynns Falls*, Jones Falls*, Back River*, Liberty Reservoir*, Loch Raven Resevoir*, Prettyboy Resevoir*, Lower Gunpowder Falls, Bird River, Middle River	nutrients, SAV, impervious surface, stream buffers, population density, stream indicators
Calvert	Patuxent River Middle*	population density
Caroline	Tuckahoe Creek*, Upper Choptank*	nutrient loads, SAV, benthos, wetlands, soil erodibility, stream buffers
Cecil	Upper Elk River, Back Creek, Sassafras River*	nutrient loads, SAV, stream indicators, soil erodibility
Charles	Mattawoman Creek	SAV, population density, wetlands, stream indicators (fish and benthos)
Dorchester	Transquaking Creek	nontidal benthos, wetlands, soil erodibility
Harford	Loch Raven Reservoir*, Bynum Run, Swan Creek, Bush River	impervious surface, stream buffer, nutrients, SAV
Kent	Sassafras River*, Stillpond Fairlee, Middle Chester River*, Langford Creek	nutrient loads, SAV, soil erodibility, stream indicators, wetlands, stream buffers
Prince Georges	Piscataway Creek, Patuxent River Middle*, Western Branch, Oxon Creek, Anacostia River*, Patuxent River Upper*, Mattawoman Creek*	SAV, population density, wetlands, stream indicators, nutrients, impervious surface
Queen Anne's	Middle Chester River*, Corsica Creek, Wye River*, Kent Island Bay, Tuckahoe Creek*	nutrient loads, stream buffers, impervious surface, soil erodibility, wetlands
Somerset	Manokin River, Lower Pocomoke River*	nutrients loads, stream indicators, wetlands, soil erodibility, SAV

St. Mary's	Breton Bay	submerged aquatic vegetation, wetlands, soil erodibility
Talbot	Tuckahoe Creek*, Upper Choptank*, Wye River*	nutrient loads, wetlands, soil erodibility, SAV, benthos, stream buffers
Wicomico	Wicomico River Head, Lower Wicomico River, Upper Pocomoke River*	nutrient loads, wetlands, soil erodibility, SAV
Worcester	Upper Pocomoke River*, Assawoman Bay, Newport Bay, Isle of wight, Lower Pocomoke River*	nutrient loads, stream indicators, wetlands, soil erodibility, SAV, impervious surface, stream buffer

* indicates that the watershed is in multiple counties.

[1] additional information on and descriptions of these indicators can be found in the Maryland Clean Water Action Plan (1998) which is available on the Department of Natural Resources Website: www.dnr.state.md.us/cwap.

In addition, the Unified Watershed Assessment identified 21 coastal watersheds (some of which correspond to those listed above) that are currently in good condition and/or contain sensitive species. These watersheds would benefit from additional protection and preservation. Finally, Maryland recognizes the balance between its watersheds and aquatic resources. Protection of these resources needs to take place using both land and water management.

Maryland is now in the process of creating watershed restoration action strategies for priority category 1 watersheds. These strategies will take a holistic approach to identifying watershed issues and developing a strategy for improvement. This includes landuse change, nonpoint source pollution, and water quality improvement, and resource preservation. Local governments will take the lead, working with state agencies, the public and other stakeholders, in creating a plan that best serves their needs.

2. Identify areas in the coastal zone which possess sensitive coastal resources (e.g., wetlands, waterbodies, fish and wildlife habitats, threatened and endangered species and their critical habitats) and require a greater degree of protection from the cumulative or secondary impacts of growth and development.

Area	**CSI Threats / Sensitive Coastal Resources**
Wetlands	loss of wetland habitat, draining and filling, erosion, development, invasive species
Farm lands	conversion of land to development, nutrient loading, fragmentation, loss of rural identity
Forest lands	fragmentation, loss of habitat, conversion of land to development
Urban Areas, Development	transportation congestion, impervious surfaces, loss of habitat, erosion, nutrient loading
Streams/Rivers	nutrient and toxic loading, habitat modification, stream flow modification, erosion

Coastal Bays	nutrient loading, habitat loss, submerged aquatic vegetation, fisheries, invasive species, conflicting uses, clamming
Chesapeake Bay	nutrient loading, toxic loading, submerged aquatic vegetation, oysters, fisheries, invasive species, conflicting uses

Management Characterization

1. Identify significant changes in the state's ability to address CSI since the last assessment (i.e., new regulations, guidance, manuals, etc...). Provide the following information for each change: (1) Identify the change & whether it was a 309 change; (2) Briefly summarize the change; (3) Characterize the effect of the change.

Following is a list of programs and regulations that reflect changes to Maryland's ability to address Cumulative and Secondary impacts since the last assessment:

Economic, Growth, Resource Protection and Planning Act of 1992 – The Economic Growth, Resource Protection, and Planning Act of 1992 (the "Growth Act") was passed by the General Assembly to direct growth to areas with existing infrastructure and to protect sensitive areas. The Growth Act enabled Maryland and its municipal and County governments to incorporate seven visions into their plans and zoning ordinances: 1) development is concentrated in suitable areas; 2) sensitive areas are protected; 3) in rural areas, growth is directed to existing population centers and resource areas are protected; 4) stewardship of the Chesapeake Bay and the land is a universal ethic; 5) conservation of resources, including a reduction in resource consumption, is practiced; 6) economic growth is encouraged and regulatory mechanisms are streamlined; and 7) funding mechanisms are addressed to achieve these visions (Article 66B, Annotated Code of Maryland)

Local governments were required to revise their comprehensive plans and implement sensitive areas protection ordinances by July 1, 1997 to comply with the Act. Local governments that failed to include, by mid-1998, a sensitive areas protection element in their plan and/or failed to adopt companion sensitive areas regulations to their comprehensive plan, were subject to the imposition of such requirements by the state Economic Growth, Resource Protection and Planning Commission. A complete sensitive areas protection element includes goals and objectives to protect streams and their buffers, 100-year floodplains, habitats of threatened and endangered species, and steep slopes.

Funded under Section 309, DNR's Growth and Resource Conservation Division coordinated comments from the Department's Forest Wildlife and Heritage Division, the Land and Water Conservation Service, Environmental Review, Program Open Space, Tributary Strategies Program and Critical Areas Commission on all local and municipal comprehensive plans. As of October 1998, all local governments revised their comprehensive plans to include sensitive areas elements, and implemented ordinances, to comply with the Act. Section 309 funds were used to support some counties in meeting their sensitive area elements. In addition, staff funded through Section 309 work on local government sensitive areas planning by providing technical assistance and coordinating Department-wide review of local comprehensive plans in order to ensure the inclusion of sensitive area protection elements as required by the 1992 Planning Act.

Smart Growth and Neighborhood Conservation Initiative – In its 1997 Session, the Maryland General Assembly strengthened the state's response to the continuing and damaging effects of suburban sprawl by enacting Governor Parris N. Glendening's Smart Growth and Neighborhood Conservation Initiative. This legislative package marshals the State's financial resources to support growth in Maryland's communities and to limit development in agricultural and other valuable resource areas.

Maryland's Smart Growth Initiative essentially has three straightforward goals:

- Preserve our most valuable remaining natural resources before they are lost forever;
- Support existing communities and neighborhoods by targeting State resources to support development in areas where the infrastructure is already in place; and
- Save taxpayers millions of dollars in the unnecessary cost of building the infrastructure required to support sprawl.

The General Assembly approved a package of laws and programs that included: Rural Legacy, Priority Funding Areas, Brownfields, Job Creation Tax Credit, and Live Near Your Work. Since the last assessment, progress has been made in all the above areas. This assessment will place additional focus on the Rural Legacy Program since it was partly funded through Section 309.

Rural Legacy – The Rural Legacy Program provides the focus and funding necessary to protect large, contiguous tracts of land and other strategic areas from sprawl development and to enhance natural resource, agricultural, forestry and environmental protection through cooperative efforts among state and local governments and land trusts. Protection is provided through the acquisition of easements and fee estates from willing landowners and the supporting activities of Rural Legacy Sponsors and local governments. Since the adoption of the Rural Legacy Program in 1997, DNR has led a Statewide effort to implement the Program. This has included developing a Rural Legacy Manual and Application, conducting outreach and technical assistance to local governments and sponsors across the State, and leading two review cycles of applications by the related State Agencies (DNR, MDA & MOP) and the Governor appointed Rural Legacy Advisory Committee. Staff funded in part through Section 309 assist in the implementation of the Rural Legacy Program including conducting public outreach to local governments and sponsors on natural resources protection, land preservation and Smart Growth.

Over the first three years of the program's existence, the State committed nearly $100 million to preserve more than 47,000 acres. This effort has involved 20 of Maryland's 23 counties and the activities of 21 land trusts. A number of these lands are in the coastal zone. Their preservation works to maintain open spaces and improve water quality. The selection process also supports applicants that incorporate CZM initiatives, such as public access. DNR has also worked with the local sponsors to review and provide comments on project agreements, easement valuation systems, and easements to be submitted by the Board of Public Works (BPW). DNR also continues to provide professional guidance to local sponsors on easement transactions. As of December 1999, easements and or fee simple acquisitions have been approved by the BPW for the Lands End, Patuxent, Little Pipe Creek and Piney Run Rural Legacy Areas.

Green Building – The goal of the Smart Growth and Neighborhood Conservation Initiative is to direct growth to areas where it can best be accommodated, while protecting valuable natural resources. Maryland's Green Building Program complements this goal by addressing the question of how we build, and how it impacts our lands and communities. Green building is the design and construction of buildings, and the development of sites, in a manner that encourages the efficient use of materials and natural resources, protects ecosystems, habitats and hydrology, and promotes sustainable communities. Maryland's Green Building Program was created in 1997 to increase the awareness and use of environmentally responsible building practices, materials and site designs. Maryland's Green Building Program takes a holistic approach by focusing on the building practices, local government planning process and the impact of buildings on the landscape. Department of Natural Resources staff working on this program were funded in part through Section 309.

Sustainable or "green" building practices support Smart Growth by conserving energy, water resources and other natural resources; preserving local, state and national environmental quality; strengthening local economies by using locally produced materials and labor; promoting human health and safety; creating higher quality enduring structures; and offering cost reductions in building maintenance, solid waste disposal and energy. In June, staff initiated the Maryland Green Building Network (MdGBN), an ad-hoc working group of architects, builders, interior designers, manufacturers, businesses, other state agencies, local governments, environmental advocacy organizations and citizens who meet monthly to assist Program staff with promoting and demonstrating green building and sustainable design throughout the State.

Smart Codes –"Smart Code" legislation (SB207/HB284 and SB208/HB285) was passed during the 2000 legislative session, creating the enabling legislation to draft the Maryland Building Rehabilitation Code and directing the Maryland Department of Planning to draft zoning models to promote infill and mixed-use development. This legislation responds to several key trends in the state (1) new residential and commercial development is consuming agricultural land, forests, and other undeveloped land; (2) thousands of existing buildings in our communities are not being fully utilized or are abandoned; (3) many existing buildings contain historic architectural elements that are in danger of deteriorating or being lost; (4) migration of businesses and residents out of our cities and towns threatens the economic vitality, health, and safety of the citizens living in these communities; (5) vacant and underutilized buildings pose a threat to the health, safety, and welfare of the citizens of the State; and (6) there is private and public interest in rehabilitating older buildings, which would be enhanced if regulatory procedures and standards regarding rehabilitation and reuse are made predictable, consistent, and flexible. Growth and Resource Conservation Division staff funded under Section 309 have been active representing DNR on the task force which is reviewing how to implement the legislation.

Maryland Coastal Bays Program – In 1999, the efforts of the Maryland Coastal Bays Program (MCBP) culminated in a Comprehensive Conservation and Management Plan (CCMP) aimed at preserving Maryland's precious coastal resources. Since U.S. EPA approval of the CCMP, the MCBP has focused on implementing more than 100 actions targeted to begin during the program's first year. (For more details on the CCMP, go to the Special Area Management Plan section of this Assessment). Several of the important implementation gaps identified by the program involve

cumulative and secondary impacts. These include: (1) developing small watershed analyses to establish buffers along the water's edge, (2) enforcing new state stormwater regulations, (3) establishing sensitive aquatic habitat areas that warrant special protection, (4) developing fisheries management plans for both finfish and shellfish, (5) preparing a Comprehensive Forestry Strategy, and (6) establishing a master plan to manage the myriad of navigation and dredging activities conducted in the coastal bays and their tributaries. As these actions progress forward the information learned will be used to revise and develop management plans in the coastal bays. Possible changes that have been identified include: comprehensive subwatershed plans, a wateruse plan, identification of marine protected areas, and revisions to the county comprehensive plan.

To meet some of the need identified in the CCMP creation process, DNR sponsored a two part study using Section 309 funds on the *"Economic Impacts of Growth and Land Use Change on Coastal Bays Resources."* The first part of the study determined the fiscal impacts of alternative development patterns. The second part of the study estimates the economic value of the Bays' natural resources. Additional information on this project can be found in the funded projects section of this Assessment.

Tributary Strategies – In 1992, the Chesapeake Bay Program Executive Council directed all Bay partners to develop "tributary strategies" – watershed based plans to reduce nitrogen and phosphorus entering the Bay's rivers. The goal of the Tributary Strategies was to introduce a new working relationship between the federal, State and local governments, business, the agricultural community and citizens to improve water quality and enhance living resources in the Chesapeake Bay. Over two years, State coordinators met with farmers, local governments, environmentalists, and other citizens to discuss and develop the tributary strategies in each of ten tributary basins.

To help implement these strategies "Tributary Teams" were formed in each of the ten basins. Appointed by Governor Glendening in 1995, with input from local governments and other interested parties, the Teams are made up of representatives of State and local agencies, farmers, business, environmental organizations, federal facilities and citizens. The teams continue to work through (1) scheduled and flexible implementation; (2) coordinated participation among interested parties; and (3) public education.

In the past three years, team efforts have included discussion of and creation of task forces for public drainage ditches; wetland and stream restoration; septic system management; erosion and sediment control; stormwater management; and public outreach. Section 309 funding has gone to the integration of growth management into the Tributary Strategies. The Maryland Office of Planning has been working with the Tributary Teams by providing information and technical assistance regarding growth management and incorporating growth management principals into updated tributary strategies (see Chapter 2). With the signing of the Chesapeake 2000 Agreement, efforts are underway to update the tributary goals. This includes the establishment of new nutrient and sediment loads to the individual tributaries. These loads will be based on aquatic living resource needs.

Coastal Nonpoint Pollution Control Program – In 1990, Congress passed the Coastal Zone Act Reauthorization Amendments which included a coastal nonpoint source pollution control program

(Section 6217). Section 6217 requires that each state with an approved CZMP develop and submit a Coastal Nonpoint Pollution Control Program. The purpose of the program "shall be to develop and implement management measures for nonpoint source pollution to restore and protect coastal waters, working in close conjunction with other state and local authorities." In December 1999, Maryland became the first state to have an approved Coastal Nonpoint Pollution Control Program. This Program is the result of a concentrated effort to develop management measures that reduce the generation and delivery of polluted runoff. Maryland's Program has worked with state and local government agencies to see that these management measures are applied to agricultural lands, developed lands, forested lands, marinas and hydromodification activities. This effort was a success in part due to funding under Section 309 of the Coastal Zone Management Act. Specific nonpoint source projects included the Clean Marina Initiative (see below), the Maryland Stormwater Design Manual, septic system modeling, and the Baltimore County Rural Sanitary District. For specific information on any of the above Section 309 funded projects please see the project summaries at the beginning of this document.

Now that Maryland's Program has been approved by NOAA and EPA, efforts will focus on the ability to track success in implementing the program. This will require the development of an enhanced tracking system. In addition, efforts will be made to create demonstration sites that incorporate the various management measures.

Marine Sewage Pumpouts/Discharge – Several State laws passed in 1994 continue to help provide for the proper disposal of boat sewage in Maryland waters. One law requires all marinas with 50 slips or more that berth vessels greater than 22 feet to have a marine sewage pumpout by June 30, 1997. Another, effective July 1, 1997, incorporates the federal U.S. Coast Guard law on Marine Sanitation Device into State law to allow for enforcement by state Natural Resource Police. Ongoing development of the Pumpout Program has led to the installation of over 260 pumpout facilities. New legislation that was passed during the 1999 session required DNR to identify areas of the State that are sensitive to the discharge of marine sewage. Specifically, Natural Resources Article §8-742 required that the following actions be taken.

On or Before January 1, 2000

- DNR will report to legislature on strategies to improve boater compliance with marine sanitation laws.

On or Before April 15, 2000

- Identify the number, location, and utilization of pumpouts.
- Identify the number of recreational vessels with Type I, Type II, or Type III MSDs or portable toilets.
- Identify waters that support living resources that are sensitive to the discharge of boat sewage.

On or Before April 15, 2001

- Take steps to provide pumpouts in sensitive areas.
- DNR must consult with MDE on identification of sensitive areas and providing pumpouts in those areas
- DNR will make recommendations, if appropriate, to MDE for changes to existing water

quality standards.

This law creates the potential for No Discharge Areas. It is likely that certain "sensitive" areas will be designated as no discharge areas (NDAs) within the next three years. Although NDAs are not addressed in NR§8-742, a number of the above requirements are prerequisites for federal NDA designation.

Additionally, the 2000 Chesapeake Bay Agreement addresses boat discharge in the following two commitments: (1) By 2003, establish appropriate areas within the Chesapeake Bay and its tributaries as "no discharge zones" for human waste from boats. By 2010, expand by 50% the number and availability of waste pump-out facilities and (2) By 2006, reassess progress in reducing the impact of boat waste on the Bay and its tributaries. This assessment will include evaluating the benefits of further expanding no discharge zones, as well as increasing the number of pump-out facilities.

Petroleum Control Practices for Recreational Boaters and Marinas – The objectives of the Petroleum Control project have been rolled into the Clean Marina Initiative. The Clean Marina Initiative, which will be described in more detail below, is a 309-funded project that promotes and celebrates the voluntary adoption of measures to reduce pollution from marinas and recreational boats. The two projects were merged so that pollution control measures could be comprehensively addressed through one program. The effect of this change is that marina operators and boaters now have a single point of contact for information about how to minimize pollution from all aspects of recreational boating.

Pollution Prevention at Marinas: An Educational Outreach Effort for Marina and Boat Operators – The Clean Marina Initiative was developed with federal FY '97, '98 and '99 Section 309 funding (see Chapter 2 for additional information). It is a program that recognizes environmentally-responsible marinas. The program is coordinated by DNR in partnership with representatives of the marine industry. Together, DNR and members of an advisory committee developed the content of the *Maryland Clean Marina Guidebook* and the structure of the awards program. The *Guidebook* provides a comprehensive review of pollution prevention practices for marinas. Chapters address: siting considerations for new and expanding marinas; marina design and maintenance; stormwater management; vessel maintenance and repair; petroleum control; sewage handling; waste containment and disposal; marina management; and laws and regulations. The awards program recognizes those marinas that adopt a certain percentage of the recommendations in the *Guidebook*. The goal of the Initiative is to certify 25 percent of Maryland's 600 marinas as Clean Marinas by 2004. Since1999, seventy-eight marinas have signed the Clean Marina Pledge. Ten have achieved Clean Marina status.

Boater education is a very significant component of the Clean Marina Initiative. Materials have been developed to encourage boaters to practice clean boating habits and to patronize certified Clean Marinas. Materials include:

- clean boating tip sheets that provide clear and concise descriptions of environmental issues and solutions associated with topics such as fuel handling and sewage disposal;
- clean boating tip cards which provide a handy, waterproof summary of pollution prevention practices;

- petroleum control kits which contain an oil absorbent pad, a petroleum control brochure, and a sticker describing how to use and dispose of the pad (the petroleum control kits are a continuation of the Petroleum Control Practices for Recreational Boaters and Marinas project formerly funded under a CZM grant); and
- advertisements in marine publications.

There is no longer a lack of information available to marinas and boaters on BMPs. The Clean Marina Initiative actively promotes the importance of preventing pollution. Continued funding is needed, however, to insure that the message continues to be delivered. Additionally, the two biggest hurdles facing marina operators who want to implement BMPs are time and money. While it is up to marina managers to dedicate time to pollution prevention, the government can assist by providing cost-share assistance to install best management practices.

Septic Systems – The cumulative impact of septic systems, or on-site disposal systems (OSDS), on water quality is a major concern in Maryland. Statewide there are over 400,000 OSDS, serving one in five Maryland households. Most of these are conventional OSDS, which are designed to remove solids and pathogens from wastewater in order to protect human health. Some systems, however, are not functioning properly due to age, neglect in operation and maintenance, or improper siting and installation. It has been estimated that as much as 30 percent of the nitrogen in groundwater in the coastal zone comes from OSDS. But, compared with Maryland's nationally recognized efforts to address discharges from wastewater treatment plants and agricultural lands, septic system discharges have received little attention.

In October 1998, at the request of the Tributary Teams, the Governor's Chesapeake Bay Cabinet endorsed the creation of a broad-based task force to review new septic systems regulations being introduced and to evaluate the possibility of using technologies that reduced nutrients while also hydraulically removing pathogenic wastewater. The task force completed their work in the fall of 1999, reporting its findings to the Chesapeake Bay Cabinet in September. After review and discussion of a wide range of technical and policy issues relating to on-site systems, the task force came to consensus on recommendations to:

- identify areas within the State that need immediate protection from OSDS impacts, called Areas of Special Concern;
- outline management districts and management agreements that should be required for Areas of Special Concern, community and shared systems, and newly installed or shared systems that utilize non-traditional technologies;
- broaden existing educational efforts to more effectively reach home owners, local governments, and other key audiences;
- call for the training and licensing or certification of OSDS inspectors, haulers, and installers;
- require inspections of existing OSDS at the time of real estate transfer, expansion, and change of use;
- call for immediate measures to address the problems of communities with widespread septic system failure;

- encourage the widespread adoption of non-traditional systems, and ensure that they function properly; and
- encourage the use of shared systems with nutrient reduction in areas consistent with Smart Growth.

The recommendations of the OSDS Task Force were forwarded, by the Governor, to the Governor's Septic System Advisory Committee. Legislation was developed by the Committee, (HB283, and SB210), that focused primarily on areas of special concern. The proposed legislation was debated during the 2000 Legislative Session and ultimately sent to Summer Study for further consideration. It was not reintroduced in 2001.

In addition, the Coastal Bays Program has objectives in it Comprehensive Conservation Management Plan to work towards being designated an Area of Special Concern. Worcester County has agreed to this proposal. In addition, the county has applied for and received a grant to create a tracking system. Other efforts include a focus on public awareness.

Riparian Forest Buffer Initiative (RFBI) – In October 1996, the Chesapeake Bay Executive Council adopted the following goals: (1) to assure, to the extent feasible, that all streams and shorelines be protected by a forested or other riparian buffer; (2) to conserve existing forests along all streams and shorelines and; (3) to increase the use of all riparian buffers and restore riparian forests on 2,010 miles of stream and shoreline in the watershed by 2010, targeting efforts where they will be of greatest value to water quality and living resources.

Section 309 funding has been used since the last assessment to develop a riparian forest buffer implementation plan, Maryland Stream ReLeaf. The plan is designed to identify appropriate sites and site owners and to create appropriate incentive packages, including educational and outreach elements, sufficient to encourage private land owners to establish RFB's on their lands (see Chapter 2 for additional information). The Stream ReLeaf Program provides the framework for reaching the goal of re-establishing 600 miles of streamside buffers by the year 2010. Maryland has already established 208 miles of forest buffer out of its total commitment of 600 miles.

The 2000 Chesapeake Bay Agreement placed a renewed emphasis on stream corridor protection. Signatories of the Agreement pledged to work with local governments, community groups and watershed organizations to develop and implement locally supported watershed management plans that address, among other things, the protection, conservation and restoration of stream corridors and riparian forest buffers by the year 2010.

Green Infrastructure – Maryland continues to grow at a rapid pace. Compounding the problems associated with rapid growth is the scattered pattern of development that consumes an excessive amount of land and fragments the landscape. As land uses change, wildlife habitat and migration corridors are lost and normal ecosystem functions are disturbed or destroyed. While landuse planners and developers are attempting to minimize such impacts, they do not always know where key natural lands and corridors are situated. The Green Infrastructure Assessment (GIA) conducted by the

Maryland Department of Natural Resources provides information that is being used to identify a Greenway Network that will protect the most critical lands in the State before they are gone forever.

The GIA starts by looking at all the undeveloped lands in the state. By utilizing the latest computer technology and data now available, the GIA can rapidly identify large, ecologically valuable areas (hubs) and a potential system of connecting corridors. The GIA can serve as a blueprint for conservation and can be used at the local, regional, and statewide level. The parts of the green infrastructure that actually achieve permanent protection through acquisition or easement will make up the state Greenway Network. (Not a 309 change)

Clean Water Action Plan – The Clean Water Action Plan was unveiled by President Clinton in February 1998. The Plan proposed a new collaborative effort by state, federal, and local governments, the private sector, and the public to restore those watersheds not meeting clean water and other natural resources goals and to sustain the healthy conditions in watersheds that currently meets these goals. The Clean Water Action Plan address all aspects of watershed conditions. The key step in this national effort are the development by states of: 1) a Unified Watershed Assessment, 2) Watershed Restoration Priorities and 3) Watershed Restoration Action Strategies.

The basis for Maryland's Unified Watershed Assessment was the comparative watershed assessment element of the Integrated Natural Resources Assessment. The best available information was used to characterize the conditions of all watersheds in the state. Based on the conditions, the watersheds were classified into four categories: Category I watersheds are not meeting clean water and other natural resource goals and are in need of restoration; Category 2 watersheds are currently meeting clean water and natural resource goals, but need preventive actions to sustain water quality and aquatic resources; Category 3 contains pristine or sensitive watersheds that need an extra level of protection; and Category 4 watersheds have insufficient data to determine their status.

The Unified Watershed Assessment (UWA) provided the foundation for setting watershed restoration, protection, and preservation priorities. Forty-three priority Category 1 watersheds were identified within the Maryland coastal zone. These watersheds, along with all priority watersheds in the state, are now the focus of efforts to create Watershed Restoration Action Strategies (WRAS). DNR's Chesapeake Bay and Watershed Programs is rededicating its various natural resource tools to help with efficient management of Maryland's watersheds. The goal is to work with local partners to develop and execute comprehensive terrestrial and aquatic conservation and restoration implementation strategies. This effort will involve making substantial use of the Program's desk-top and field-based strategic planning tools such as:

- the Clean Water Action Plan (CWAP) Priority Watershed Indicator Assessment,
- the Tributary Basin Environmental Atlas,
- Riparian Forest Buffer Targeting,
- Greenway Conservation,
- Stream Corridor Assessment, and
- Monitoring and Evaluation

Using Section 309 funds, efforts have begun to move the WRAS process forward. In 2000, five priority category one watersheds were selected to receive technical support and funding for creation of the first set of strategies. DNR staff, funded in part through 309, have been pushing the effort forward through outreach, planning and technical support. In addition, FY2000 funds were used to support county development of the strategies and stream corridor assessments. More information on this initiative will be available in the 309 Strategy.

Conclusion

1. Identify significant gaps in addressing the programmatic objectives for this enhancement area (i.e., inadequate authority, data gaps, inadequate analytical methods, lack of public acceptance, etc...).

As described in the management characterization, Maryland has a wide variety of initiatives underway that include components to manage cumulative and secondary impacts. In general, the needs of these individual programs are being met by other sources within the State. However, there are two issues mentioned in several of the individual programs where Section 309 could help. This includes watershed management and aquatic resource protection. It is felt that these needs can be handled through Watershed Restoration Action Strategies and possibly Marine Protected Areas.

Watershed Based Planning. The State is focusing more attention on the development of Watershed Strategies within the priority watersheds identified in Maryland's *Clean Water Action Plan*. The Watershed Restoration Action Strategies efforts includes developing holistic watershed strategies within these watersheds by working with local governments, other state agencies and interested stakeholders. A key to making this program a success is to have incentives for the local governments for development and implementation of these strategies in addition to the technical resources the Department is able to provide. This effort will rededicate the focus of DNR's various natural resource tools to help with efficient management of Maryland's watersheds. Issues to be considered in the development of strategies include stream buffers, smart growth, wetlands, nutrient loading, stream and tidal habitats, and resource protection.

Marine Protected Areas. Though cumulative and secondary impact management is not the only component in the protection of aquatic resources it is an important one. The new tributary strategies aquatic resource-based goals and the sensitive areas element of the coastal bays CCMP demonstrate this relationship. With the myriad of resources in the Chesapeake Bay and the coastal bays and the wide ranges of uses within these waterbodies, it may be appropriate in the future to consider the creation of marine protected areas. This effort would coincide with the national effort established by President Clinton's executive order in 2000. It would also benefit and correspond with other Section 309 enhancement areas, including wetlands, ocean resources, and special area management plans. For this reason, efforts will be made to review marine protected areas.

2. What priority was this area and what priority is it now, in the view of the coastal program?

Last Assessment - High This Assessment - High

3. Briefly justify the proposed priority.

Maryland's fragile Chesapeake Bay coastal zone borders the nation's capital and Baltimore, a second major metropolitan area, while remaining fairly rural on the eastern shore. The State's Atlantic coastal area includes Ocean City and Assateague Island, a unique estuarine system with high commercial, recreational and ecological value. Human activities on all these areas is substantial and projected to continue through the year 2020. The Chesapeake Bay and Coastal Bays Programs have demonstrated the many connections between land use and the health of natural resources, which are limited in their ability to adapt to rapid changes in Maryland's landscape. Conventional land development and building practices often consume too many natural resources and raw materials, generate excessive amounts of waste, use too much energy, disrupt natural hydrology, degrade natural ecosystem function, eliminate habitat and disrupt native biodiversity.

It is important to look at each impacted watershed individually and to take a holistic approach to managing cumulative and secondary impacts. In cooperation with partners, efforts can be made to better manage its growth and landuse change, to prevent problems before they occur, and to identify areas where restoration can make a difference. Effective watershed-based management is fundamental to many environmental, economic and quality of life issues. This enhancement area should remain a high priority.

F. MARINE DEBRIS

Section 309 Programmatic Objectives

I Develop or revise programs that reduce the amount of marine and lake debris in the coastal zone.

Marine/Lake Debris Characterization

1. In the table below, characterize the extent of marine/lake debris and its impact on the coastal zone.

Source	**Impact** (Significant/Moderate/Insignificant)	**Type of Impact** (aesthetic, resource damage, etc).
trees	moderate	hazard to navigation, aesthetic
debris washed down Susquehanna River during floods	moderate	hazard to navigation, aesthetic
abandoned vessels	moderate	hazard to navigation, aesthetic
structures	moderate	hazard to navigation, aesthetically unpleasing
debris from boaters/marinas	moderate	aesthetic, health hazard

2. If any of the sources above, or their impacts, have changed since the last assessment,

please explain.
There was a slight increase in the amount of marine debris resulting from Hurricane Floyd, however, overall the sources and impacts have not changed since the last assessment. The amount of debris expected each year is difficult to estimate due to unpredictable weather patterns.

Management Characterization

1. In the table below, identify state ocean/Great Lake management programs and initiatives developed since the last assessment.

Program	Status	309 $
State/local program requiring recycling	No	
State/local program to reduce littering and wasteful packaging	No	
State/local regulations consistent with Marine Plastic Pollution Research and Control Act	No	
Marine debris concerns incorporated into harbor, port, marina and coastal solid waste management plans	Yes	See Sec. & Cum. Impacts (Clean Marina Program discussion)
Education and outreach programs	Yes	See Sec. & Cum. Impacts (Clean Marina Program discussion)
1) River Sweep Program 2) Coastal Bays clean-ups 3) Anacostia River Clean-up	Yes	$0.00

2. For the changes identified above provide a brief description of the change and its effect.
Marine debris management is an element of the Clean Marina Program funded through Section 309. See Secondary and Cumulative Impact Section for a complete discussion of the Clean Marina Program. The Waste Containment and Disposal chapter of the guidebook prepared for marina owners outlines pollution prevention measures. This same chapter contains a tip sheet for boaters, which is used as an educational tool. Seventy-eight marinas in the State of Maryland have pledged to adopt pollution prevention measures and ten are certified Clean Marinas. The certified Clean Marinas have adopted measures from the Waste Containment and Disposal chapter.

In 1997, the 309 Assessment noted that there was a need to address ways to capture debris upriver of the hydroelectric dams on the Susquehanna River. Following the winter storms of 1998, the Susquehanna River Basin Commission hosted a panel of industry representatives, recreationalists, federal and local government agencies, and the three bordering States. The general conclusion was that all means and technologies were being utilized to control debris. Recommendations were made, however, to operate removal equipment past November each year, and to pursue a study with the U.S. Army Corps of Engineers to investigate new methodologies to handle debris. Following the panel discussion, Susquehanna River Basin Commission, in cooperation with local governments and groups, instituted a River Sweep Program to engage communities along the River in marine debris clean up

efforts.

The Maryland Coastal Bays Program, in conjunction with Assateague State Park, has sponsored several marine debris clean-up efforts since the last assessment. In June of 1998, nearly 40 volunteers scooped just under a ton of garbage from the Sinepuxent Bay behind Assateague during the first annual "Bayside Cleanup" of the Coastal Bays. The 1,900 pounds of discarded, lost, or forgotten refuse included tires, buoy and channel markers, glass and plastic bottles, aluminum cans, Styrofoam, salt-treated wood, rusted car and boat pieces, a 20-foot section of plastic snow fencing, a plastic swimming pool and an Ocean City recycling bin. The Bayside Cleanup was held as part of National Trails Day, celebrated nationwide by state and federal parks. The Coastal Bays Program also utilizes volunteers to gather marine debris along the shores of Maryland's coastal bays during both the annual Canoe Cleanup and the annual Isle of Wight Cleanup.

Conclusion

1. Identify major gaps in addressing the programmatic objectives for this enhancement area.
The Department of Natural Resource's Derelict Boat and Debris Removal Program has experienced staff and funding cutbacks in the past several years. The State currently directs limited funds towards the removal of abandoned vessels on a statewide basis, however, no longer provides debris removal services. Instead, the State provides funding to local governments for the removal of debris and derelict boats from local waters. This has put a burden on local government staff, and several counties are unable to conduct debris removal due to limited personnel.

2. What priority was this area and what priority is it now, in the view of the coastal program?

Last Assessment - Low This Assessment - Low

3. Briefly justify the proposed priority ranking.
Relative to other Section 309 Objectives, this issue is not considered a high priority. Except for a decrease in available funding, the State of Maryland considers this issue to be adequately handled through grants to local governments, the removal of derelict boats on a statewide basis, and educational and volunteer programs, such as the Clean Marina Initiative. The gaps identified will be addressed through existing programs.

G. SPECIAL AREA MANAGEMENT PLANNING

Section 309 Programmatic Objectives

I. Develop and implement special area management planning in coastal areas applying the following criteria:
   - areas including significant coastal resources (i.e., threatened and endangered species and their critical habitats, wetlands, waterbodies, fish and wildlife habitat) that are being severely affected by cumulative or secondary impacts;
   - areas where a multiplicity of local, state, and federal authorities prevents effective

coordination and cooperation in addressing coastal development on an ecosystem basis;

- areas with a history of long-standing disputes between various levels of government over coastal resources that has resulted in protracted negotiations over the acceptability of proposed uses;
- there is a strong commitment at all levels of government to enter into a collaborative planning process to produce enforceable plans;
- a strong state or regional entity exists which is willing and able to sponsor the planning program.

Resource Characterization

1. In light of the criteria listed above, identify areas of the coast subject to use conflicts that can be addressed through special area management planning.

Area	Major conflicts
Coastal Bays	Large seasonal populations and extensive development in a relatively small area threaten to destroy the environmental and economic benefits of the region

Management Characterization

1. Identify areas of the coast that have or are being addressed by a special area plan since the last assessment. (see table below)

Area	Status	309 Involvement
Coastal Bays	1. Maryland's coastal bays were designated as a National Estuary Program in 1995.	yes
	2. The Maryland Coastal Bays Program published its Status and Trends Report on Maryland's Coastal Bays in 1997.	yes
	3. The Maryland Coastal Bays Program published its Base Program Analysis of authorities in 1998.	yes
	4. The Maryland Coastal Bays Program Comprehensive Conservation and Management Plan was approved by U.S. EPA in October, 1999.	yes

2. Identify any significant changes in the state's SAMP program since the last assessment (i.e., new regulations, guidance, manuals, etc...). Provide the following information for each change: (1) Identify the change & whether it was a 309 change, (2) Briefly summarize the change, (3) Characterize the effect of the change.

Maryland's Coastal Bays Program. Maryland's Atlantic coastal bays watershed was nominated to U.S. EPA for consideration as a National Estuary Program (NEP) in 1995. The Maryland Coastal Bays Program (MCBP) was accepted as an NEP in July, 1995. The MCBP Comprehensive Conservation and Management Plan (CCMP) was approved by U.S. EPA in October, 1999.

The Program is a partnership among the Towns of Ocean City and Berlin; Worcester County; Maryland Departments of Natural Resources, Agriculture, Environment, and Planning; National Park

Service; U.S. Environmental Protection Agency and the National Oceanic and Atmospheric Administration. The CCMP (titled *Today's Treasures for Tomorrow)* is the culmination of three years of technical investigation and community involvement to protect the future of the Coastal Bays. It contains more than 300 action commitments from its member partners, including the establishment of new septic and stormwater control measures, completion of a comprehensive County forest management strategy, development of a master navigation and dredging management plan, and modifications to local codes and policies so that communities are designed with safety features that protect them from coastal hazards and minimize economic loss. Maryland DNR has been a particularly active partner in the program, undertaking numerous studies and initiatives to improve the coordination of environmental protection and economic development activities in the watershed. For example, DNR funded two economic development studies designed to (1) estimate the fiscal impact on County government of alternative land use patterns and (2) assess the economic value of the coastal bays' natural resources to the economy of Worcester County (these Section 309 studies are summarized in section II.) In addition, DNR has convened a Coastal Bays Water Use Work Group, and provided it with approximately $300,000, to oversee the implementation of the Department's commitments under the CCMP (not 309).

Finally, the Department has begun developing enforceable initiatives as part of its commitment under the CCMP. First, the MCBP CCMP contains the following action: "DNR will alleviate the impact of clam dredging and prop scarring to SAV (submerged aquatic vegetation) and other benthic organisms by...implement(ing) and enforc(ing) necessary regulations to protect SAV from clam dredging." The Maryland legislature recently passed a law regarding this issue. Each year, DNR delineates new boundaries that prohibit clam dredging in SAV beds based on photographic data. New buoys marking the restricted areas are then deployed after receiving final legal clearance by DNR Fisheries Service. Second, DNR is leading an effort to develop a comprehensive plan for fish and shellfish populations that "establishes harvest levels, as well as protects and improves habitat and water quality." In response, DNR has convened the Maryland Coastal Bays Fishery Advisory Committee to begin the development of management plans. Currently, the committee is focusing on the establishment of a management plan for the blue crab.

More than 100 actions were identified to be initiated during the program's first year of implementation. In December 2000, the Coastal Bays Policy Committee was updated on accomplishments from the first year. Among these accomplishments were (1) development of the institutional and financial infrastructure necessary to implement the program through an autonomous foundation; (2) creation of a draft blue crab fisheries management plan specific to the coastal bays; (3) development of aquatic sensitive resource maps that will be a component in the effort to balance recreational use with resource protection; (4) initiation of small watershed analyses to establish buffers along the water's edge; (5) development of a tracking system to measure program progress; (6) drafting of environmental indicators as a measure of success; and (7) work towards developing a master plan to manage the myriad of navigation and dredging activities conducted in the coastal bays and their tributaries.

Conclusion

1. Identify major gaps in meeting the programmatic objectives for this enhancement area.

The Coastal Bays Policy Committee was pleased with progress made in the first year since the signing of the CCMP. However, as year one initiatives continue to move forward, year two initiatives are now being started. Technical assistance, financial assistance and staff cooperation will continue to be key in moving the wide variety of initiatives forward. Several efforts, in addition to the ongoing projects mentioned above, were considered key for the near future. These included: stormwater management, wetlands, a coastal bays laboratory, minority representation and participation, and harmful algal blooms.

2. What priority was this area and what priority is it now, in the view of the coastal program?

Last Assessment - Medium This Assessment -Medium

3. Briefly justify the proposed priority.

The MCBP remains the only NEP in Maryland and, in a role analogous to that played by the Chesapeake Bay Program in the multi-state Chesapeake Bay drainage, is the primary vehicle for comprehensive watershed management in the State's most popular tourist destination: the Coastal Bays watershed. Each year more than 12 million people come to the region, generating more than two billion tourism dollars. As development pressures continue to rise, Maryland, along with its local, federal, and citizen partners, have invested more than three years and several million dollars to reach consensus on a long-term vision for the watershed's environment, economy, and culture. Now that the MCBP has painstakingly identified an interrelated series of priority problems and preferred solutions, program partners are faced with substantial gaps in its ability to realize that vision (see above). In order to reap the benefit of prior investments in a comprehensive conservation and management plan for the watershed, all MCBP partners, including the State, must follow through with their various commitments to implement the plan. Because of the scope of the gaps identified above, these commitments will be met through a variety of means, including those discussed in the cumulative and secondary impacts section of this document (watershed restoration action strategies and marine protected areas), as well as other management activities not funded through CZMA Section 309, such as the development of the DNR Water Use Plan for the Coastal Bays Watershed.

H. ENERGY AND GOVERNMENT FACILITY SITING

Section 309 Programmatic Objectives

I Enhancing existing procedures and long range planning processes for considering the needs of energy-related and government facilities and activities of greater than local significance.

II Improve program policies and standards which affect the subject uses and activities so as to facilitate siting while maintaining current levels of coastal resource protection.

Management Characterization

1. Identify significant changes in the state's ability to address the siting of energy and government facilities, since the last assessment (i.e., new regulations, guidance, manuals, etc...). Provide the following information for each change: (1) Identify the change & whether it was a 309 change, (2) Briefly summarize the change, (3) Characterize the effect of the

change
Maryland's Coastal Facilities Review Act provides that a person may not construct certain oil and gas related "facilities" in the "coastal area" without a permit. "Facilities" means pipelines, as well as certain immediate production terminals and refineries, crude oil storage facilities, facilities for processing, transmission or storage of natural gas, ports and harbor facilities, and fabrication yards. Additional regulations (1) forbid the state from entering into any lease that would preclude or interfere with public or private harvesting of finfish or shellfish; (2) renders the person drilling to be liable for any damages done; (3) forbids drilling in the Chesapeake Bay, its tributaries, and the critical area; and prohibits discharges of oil into state waters.

There have been no changes in these regulations since the last assessment. Some information on oil spill response can be found in this report under the Ocean Resources Enhancement Area.

Conclusion

1. Identify major gaps in meeting the programmatic objectives for this enhancement area.

There are no major gaps in Maryland's Program in this area.

2. What priority was this area and what priority is it now, in the view of the coastal program?

Last Assessment - Low This Assessment - Low

3. Briefly justify the proposed priority.

The State of Maryland considers this issue to be adequately addressed through existing management programs and activities. In addition, Mineral Management Service (MMS) is currently updating its 5 year implementation plans for offshore oil and gas leasing, and as a part of that is soliciting comments on the current moratorium (which extends to 2012). MD has had a few spills since 1997, relating to oil and gas pipelines. State actions after the 2000 Patuxent River spill have concentrated on improving the response system. This is being handled outside of the CZM program.

I. AQUACULTURE

Section 309 Programmatic Objective

I Enhance existing procedures and long range planning processes for considering the siting of public and private marine aquaculture facilities in the coastal zone.

II Improve program policies and standards which affect aquaculture activities and uses so as to facilitate siting while ensuring the protection of coastal resources and waters.

Resource Characterization

1. Briefly describe the State's aquaculture activities.

The purpose of Maryland's aquaculture program which began in 1990, is to encourage the orderly development of an aquaculture industry in Maryland, while ensuring that aquaculture operations do not adversely impact the state's wild stocks of fish and shellfish.

Since 1988, over 295 aquaculture permits have been issued for tidal and non-tidal finfish aquaculture enterprises. There are also provisions for tidal water aquaculture experimental net pens. There are approximately 830 oyster leases for 7882 acres of tidal bottom utilized for private oyster aquaculture.

In 1993, the State convened the Oyster Roundtable to address major concerns about how to bring oyster stocks in Maryland's Chesapeake Bay back to economically and ecologically healthy levels. As recommended by the Oyster Roundtable Action Plan, the Fisheries Service has established a pilot program for water column oyster culture. The purpose of these projects will be to demonstrate feasibility of various oyster production techniques. However, only three permits for experimental demonstration projects have been issued with two being active.

To simplify the process, a single point-of-contact for aquaculture permitting information has been designated in the DNR Fisheries Service. In addition, a brochure has been published describing all of the steps necessary to permit an aquaculture operation.

2. Briefly describe environmental concerns, i.e., water quality, protected areas, impacts on native stock and shell fish resources. Also, describe any use conflicts, i.e., navigational, aesthetic, incompatible uses, public access, recreation; and, future threats, i.e., shoreline defense works, introduced species.

Aquaculture regulations address various concerns including definition of a hybrid, protection of native or wild species, introduction of non-native species, prohibition of certain species, and over-nutrification of the water column when fish are confined in high concentrations. Maryland citizens, researchers, and managers have been particularly concerned that introduction of Asian oyster species, which may be less susceptible to endemic disease, would lead to the extinction of the native oyster considered by many to be better tasting. To date, the introduction of non-native oysters has not been allowed. Efforts are underway to create disease resistant oysters in hatcheries.

<u>Management Characterization</u>

1. Identify significant changes in the state's ability to address the planning for and siting of aquaculture facilities since the last assessment (i.e., new regulations, guidance, manuals, etc...). Provide the following information for each: (1) Identify the change and whether it was a 309 change, (2) Briefly summarize the change, (3) Characterize the effect of the change

The Fisheries Service administers aquaculture activities in Maryland by a permitting process authorized by law and regulations. Fisheries Service provides consultation about the permitting process, aquaculture techniques, waste management, and marketing. It collects production information, monitors environmental data collected by growers and supervises permits for compliance with rules and regulations.

In addition, the Corps is sponsoring a project as a federal /state partnership to investigate various oyster reef designs and their effectiveness in Chesapeake Bay. The main goal of this effort is the restoration of oyster habitat and populations. The aquaculture portion of this project provides for the production of spat for restoration purposes. A small portion of the funds were used to investigate the effectiveness of new grow-out technology. The results of this study will be available within the next

year.

Finally, the Coastal Bays CCMP has the promotion of aquaculture listed as a possible management option for the maintenance of sustainable clam and shellfish population. Additional effort will be needed in determining how this can best be accomplished and what the outcomes will be. In 1999, the Department of Agriculture produced the AquaFarm Products Directory. This directory lists groups who are interested in advertising their products to consumers, retailers and wholesalers.

Conclusion

1. Identify major gaps in addressing the programmatic objectives for this enhancement area.
The Department of Natural Resources has created a Mariculture & Estuarine Hatcheries Program under the Fisheries Service. This enable those interested in aquaculture and the permitting process to receive information quickly. In addition, the Department of Agriculture continues to promote aquaculture products along with other agriculture. At this time the primary gaps are technology and impact based. For example, efforts need to continue to create hatchery-raised oysters that are resistant to Dermo and MSX. Efforts are being made to meet these needs as they arise.

2. What priority is this area, in the view of the coastal program?
Last Assessment - Medium This Assessment - Medium

3. Briefly justify the proposed priority.
The Oyster Recovery Program is very important to Marylanders, not only for fisheries economy by also for maintaining water quality and reef habitat in the Chesapeake Bay. This topic is being adequately addressed at the regional and national levels. Consequently, Section 309 support will not be sought for this enhancement area.